



Planning and Assistance Division

GENERAL BASIN MAP BIG BLUE RIVER BASIN



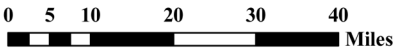
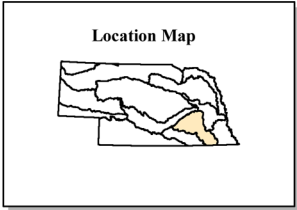
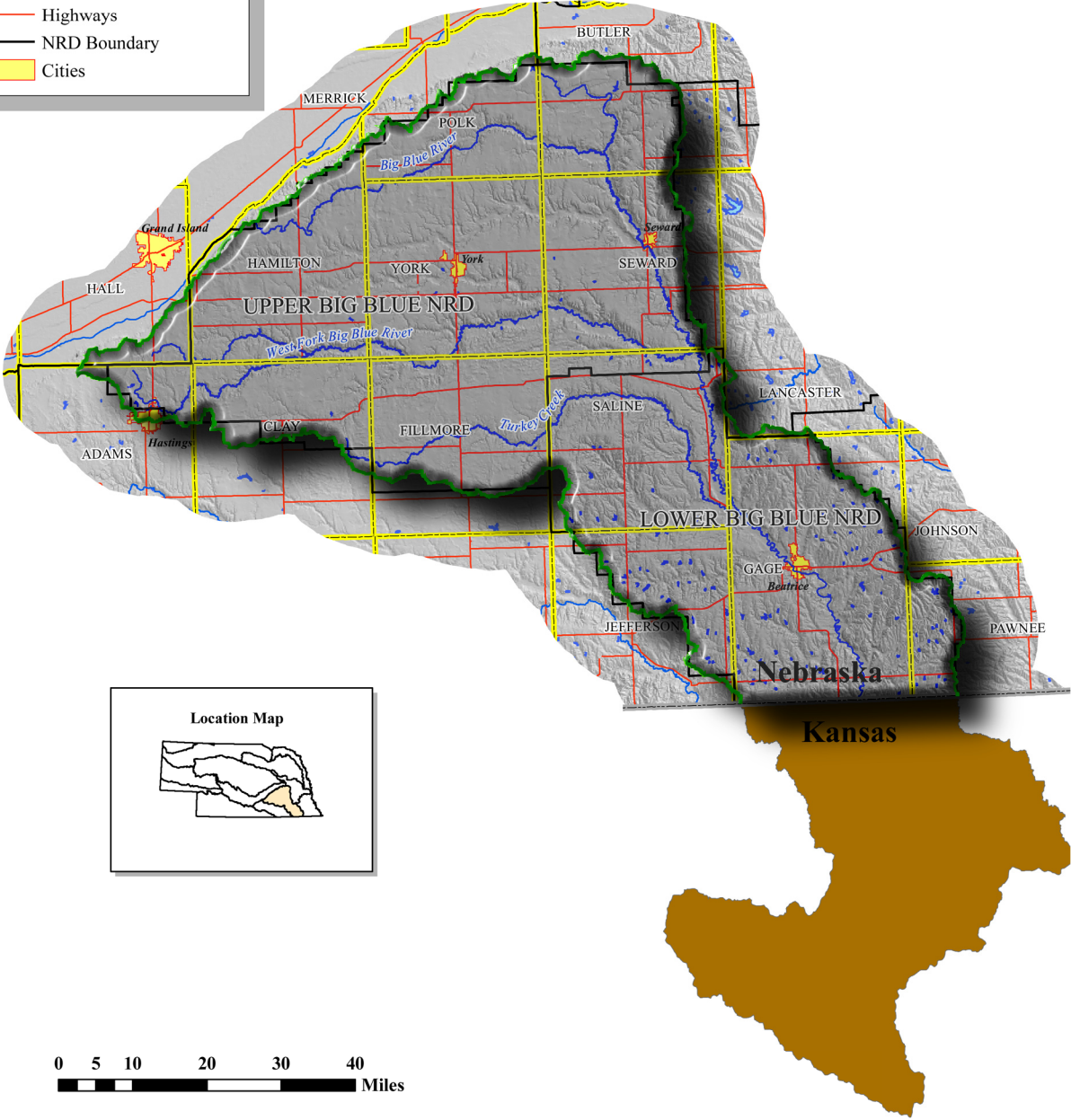
DRAFT

Explanation

- Big Blue Basin
- Big Blue Basin in Kansas
- Lakes

Cultural Features

- County Boundary
- State Boundary
- Highways
- NRD Boundary
- Cities



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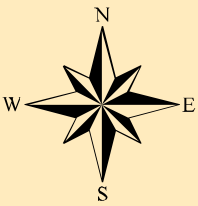
Figure BB-1.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
General basin map produced by Shuhai Zheng, September 30, 2005.

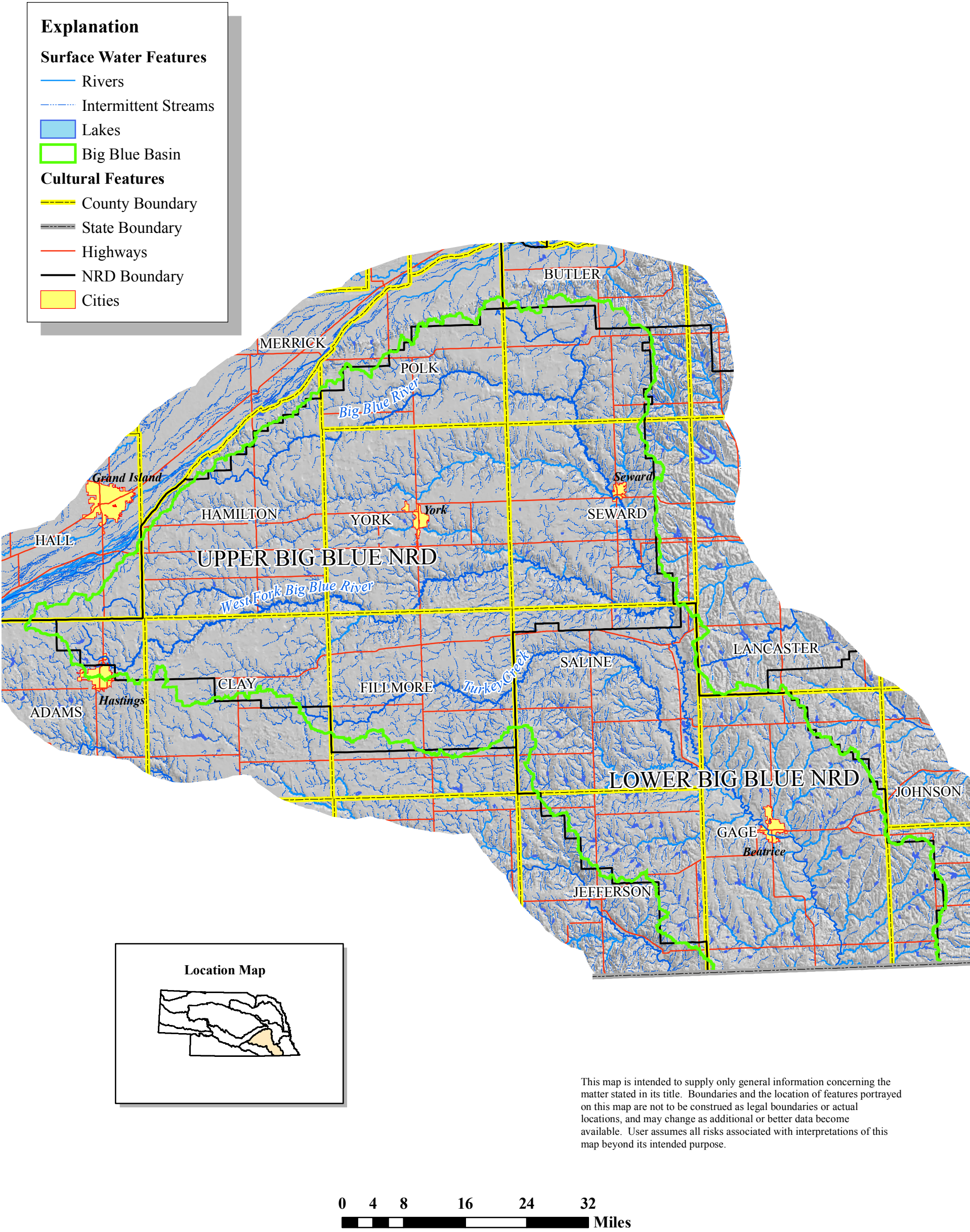


General Surface Water Features

BIG BLUE RIVER BASIN



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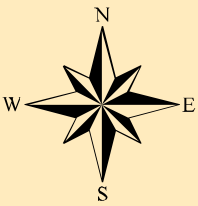
Figure BB-2.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
General surface water features map produced by Shuhai Zheng, September 30, 2005.

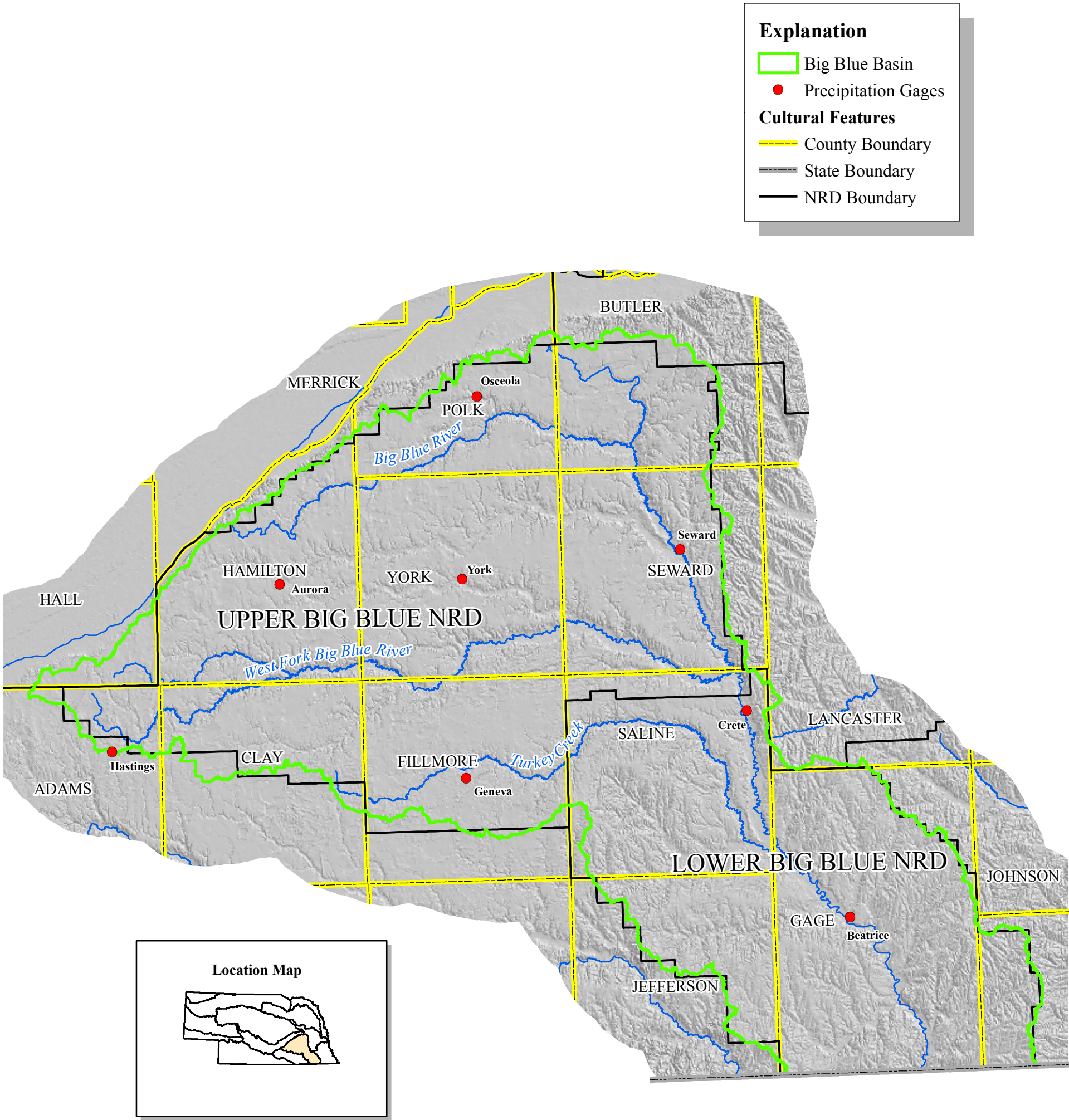


Precipitation Gages

BIG BLUE RIVER BASIN



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Figure BB-3.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Precipitation gages map produced by Jeff Shafer, October 18, 2005.

Figure BB-4. Annual Precipitation at Aurora, Nebraska.

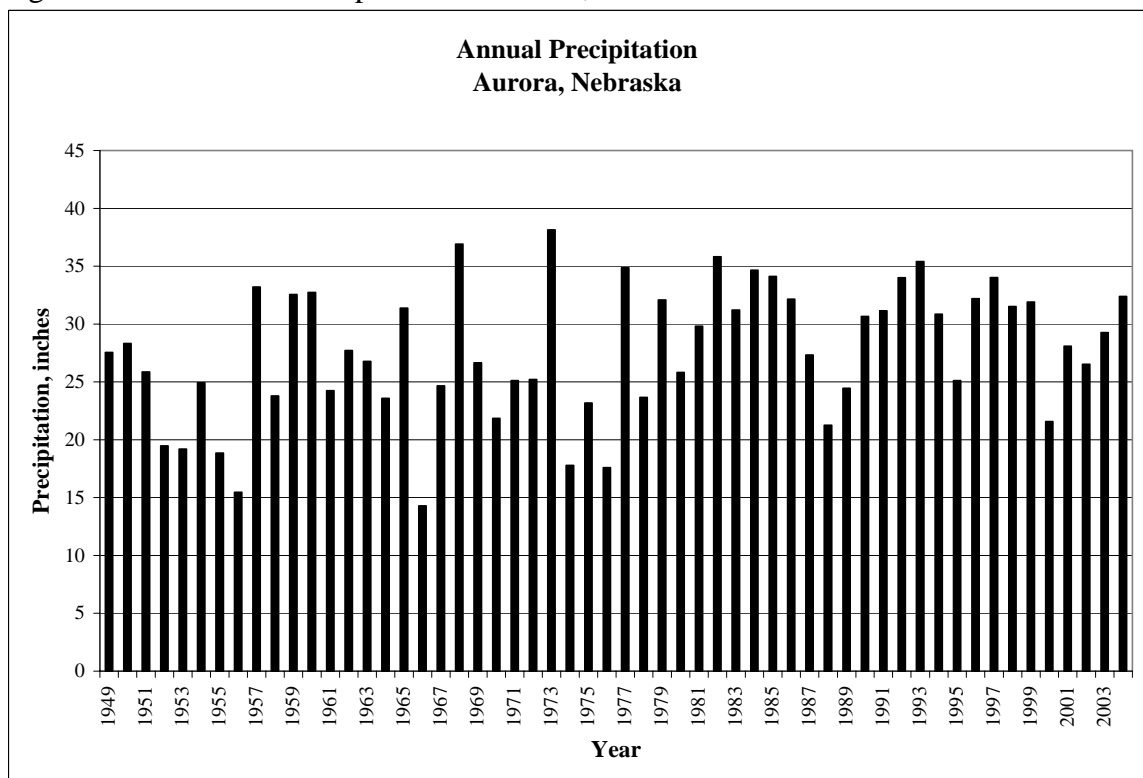


Figure BB-5. Growing Season (May-September) Precipitation at Aurora, Nebraska.

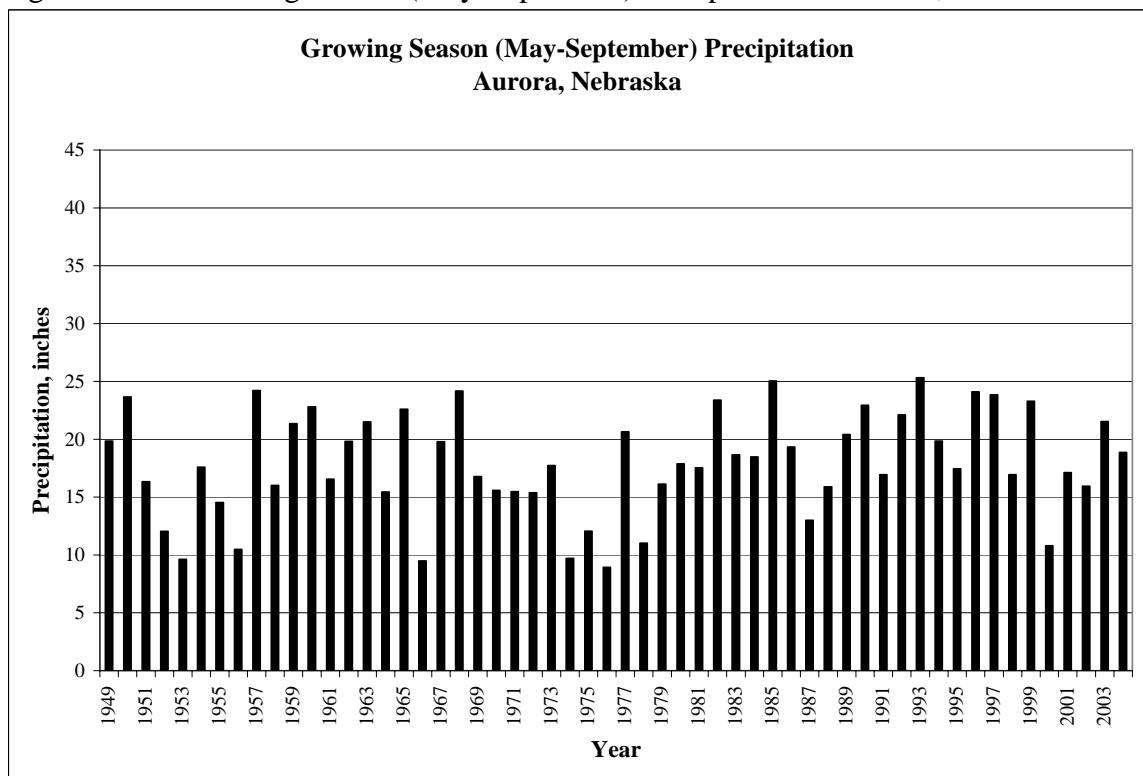


Figure BB-6. Annual Precipitation at Beatrice, Nebraska.

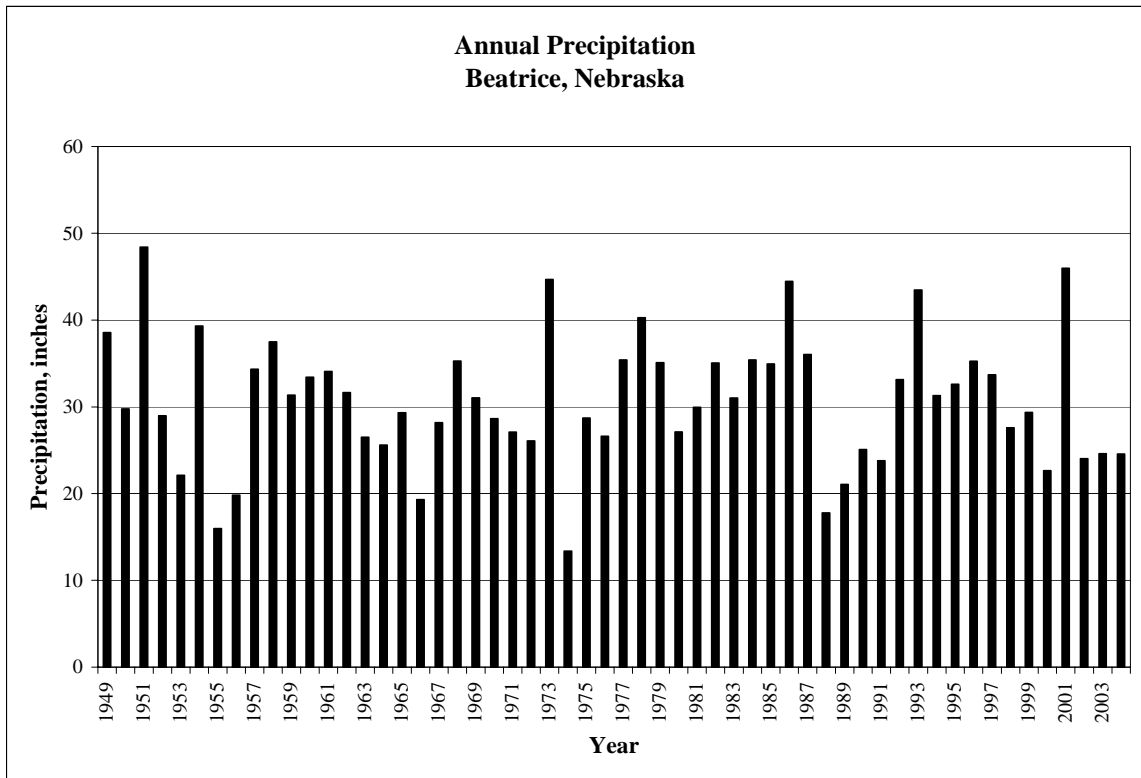


Figure BB-7. Growing Season (May-September) Precipitation at Beatrice, Nebraska.

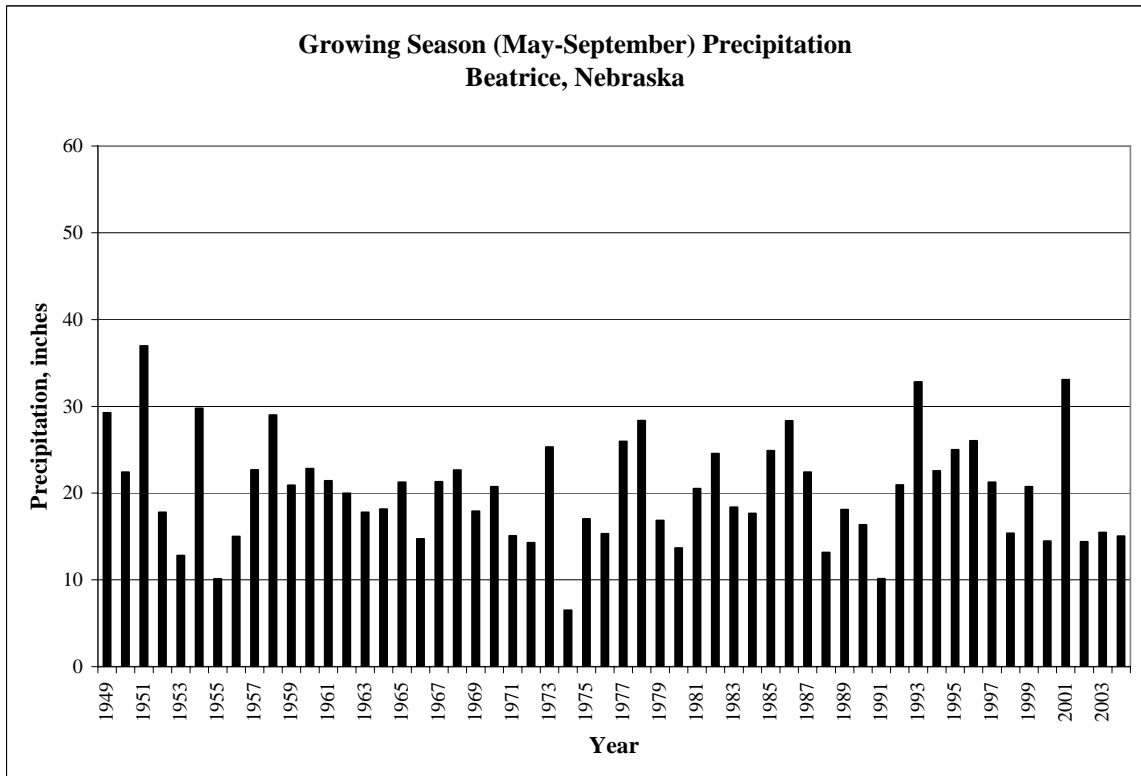


Figure BB-8. Annual Precipitation at Crete, Nebraska.

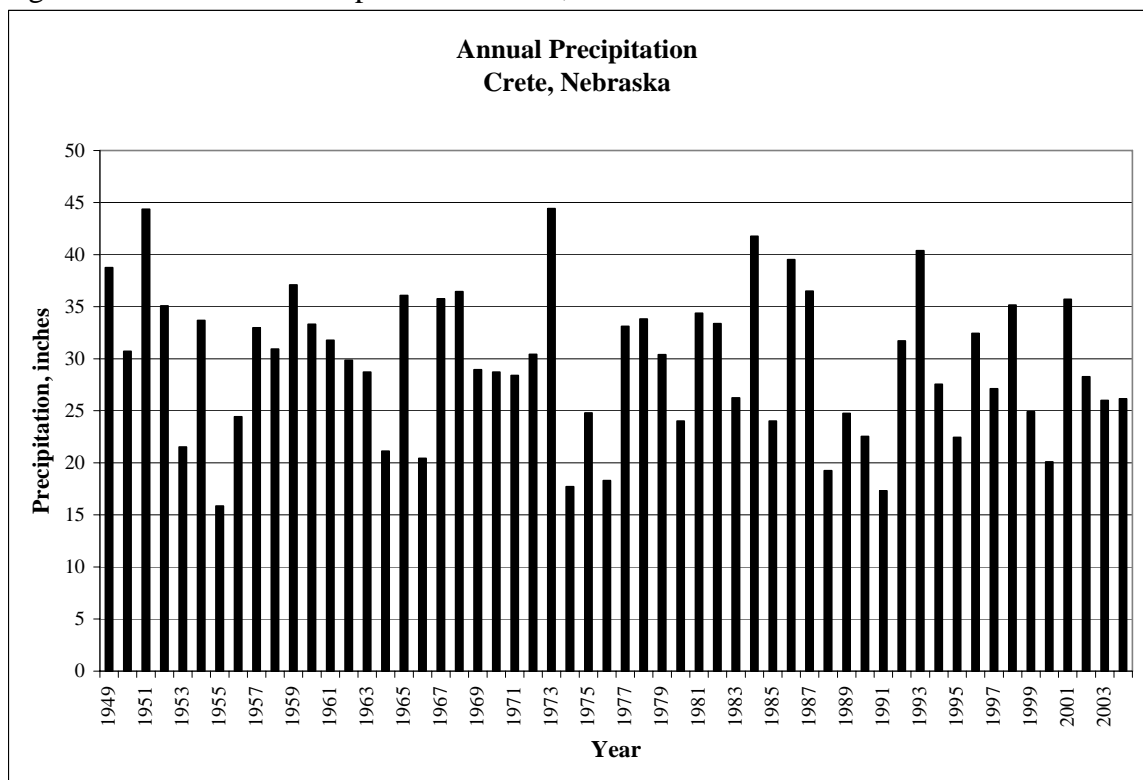


Figure BB-9. Growing Season (May-September) Precipitation at Crete, Nebraska.

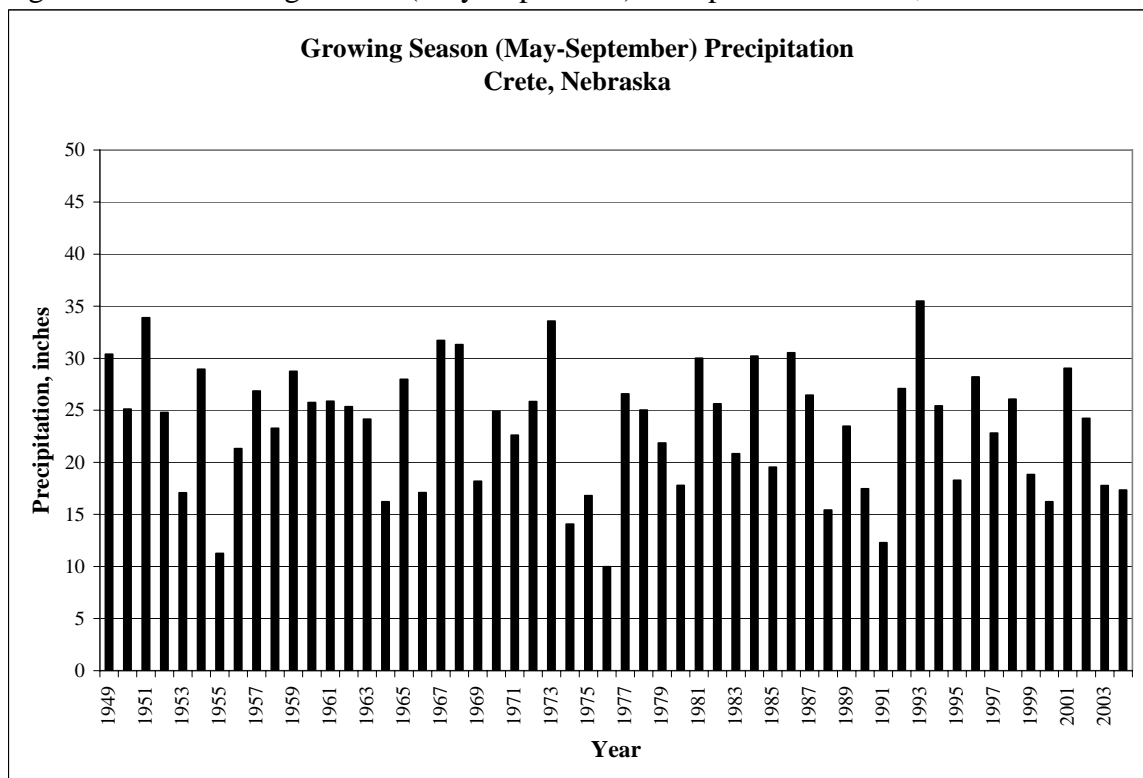


Figure BB-10. Annual Precipitation at Geneva, Nebraska.

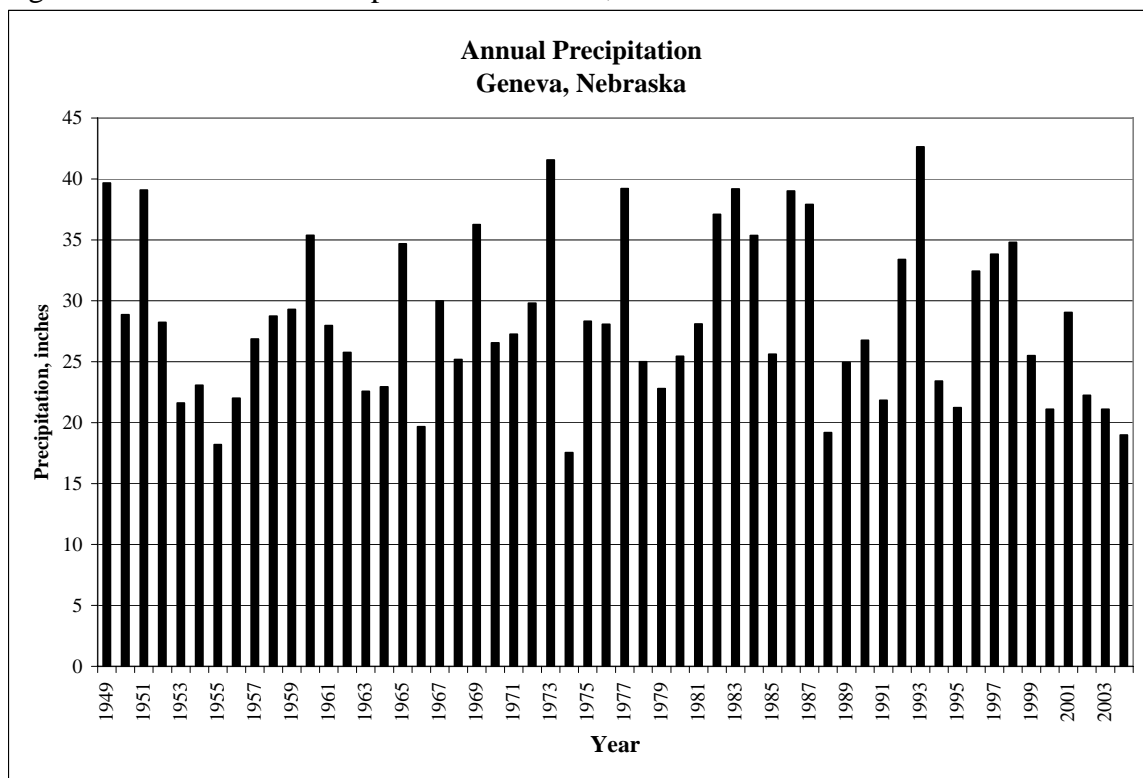


Figure BB-11. Growing Season (May-September) Precipitation at Geneva, Nebraska.

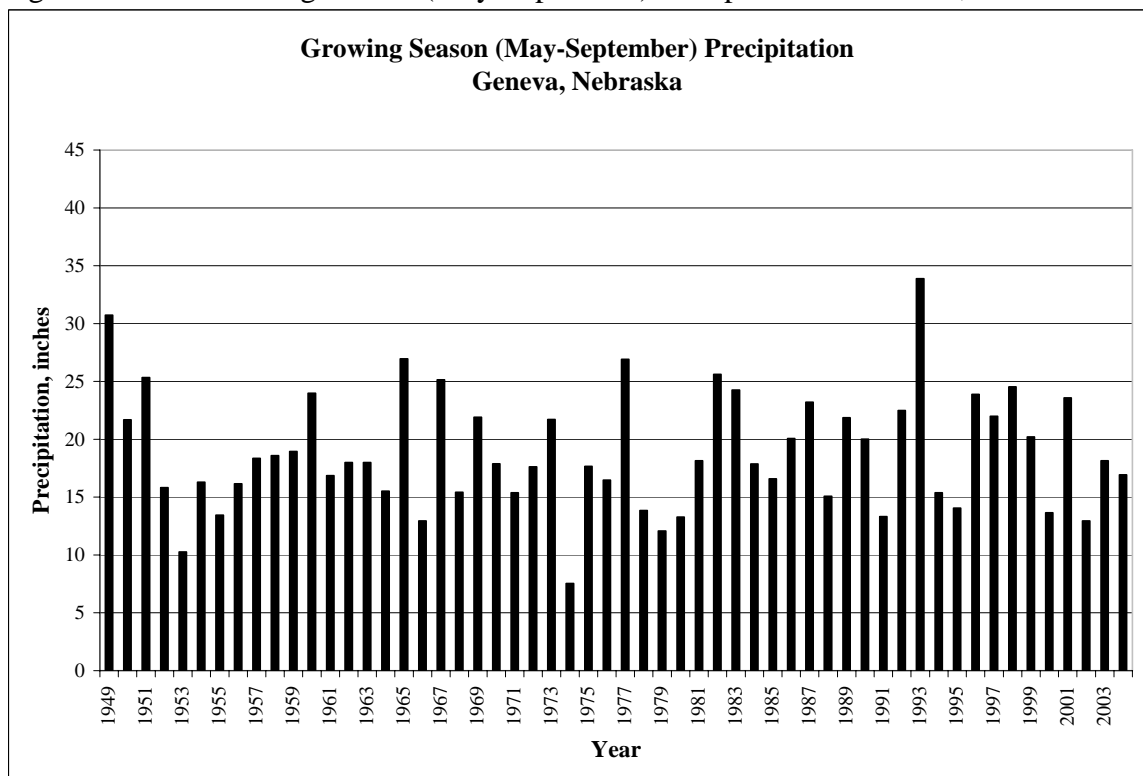


Figure LB-12. Annual Precipitation at Hastings, Nebraska.

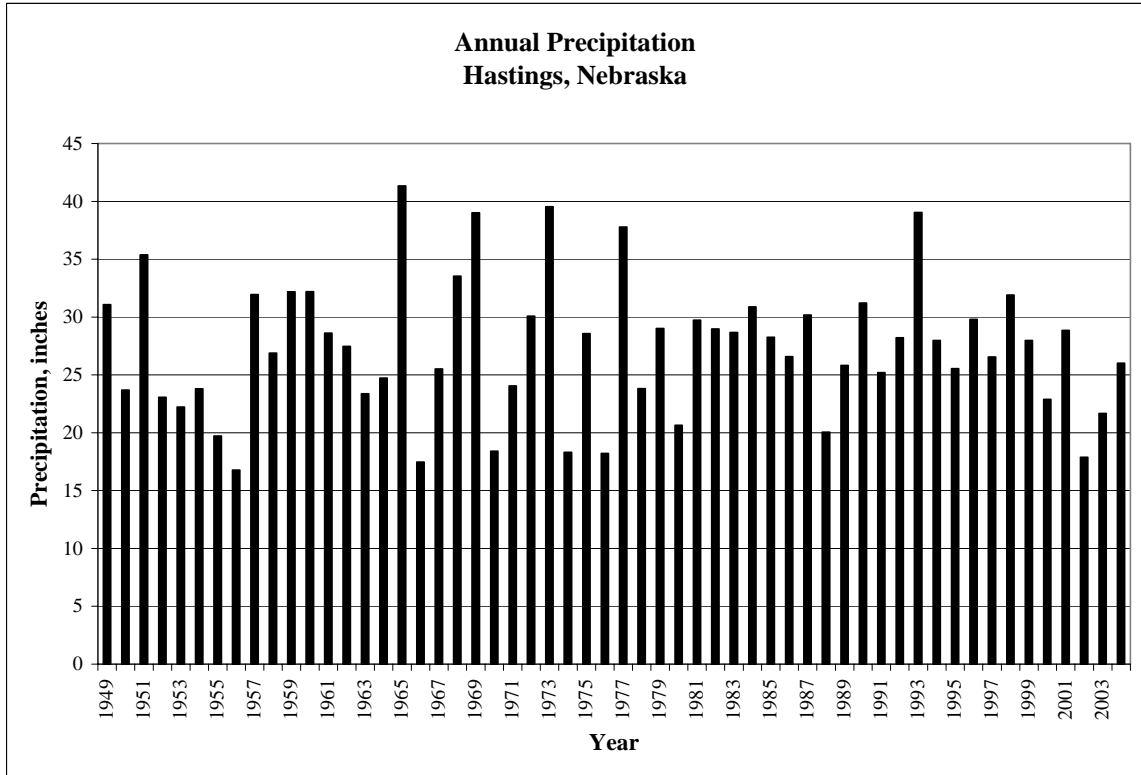


Figure LB-13. Growing Season (May-September) Precipitation at Hastings, Nebraska.

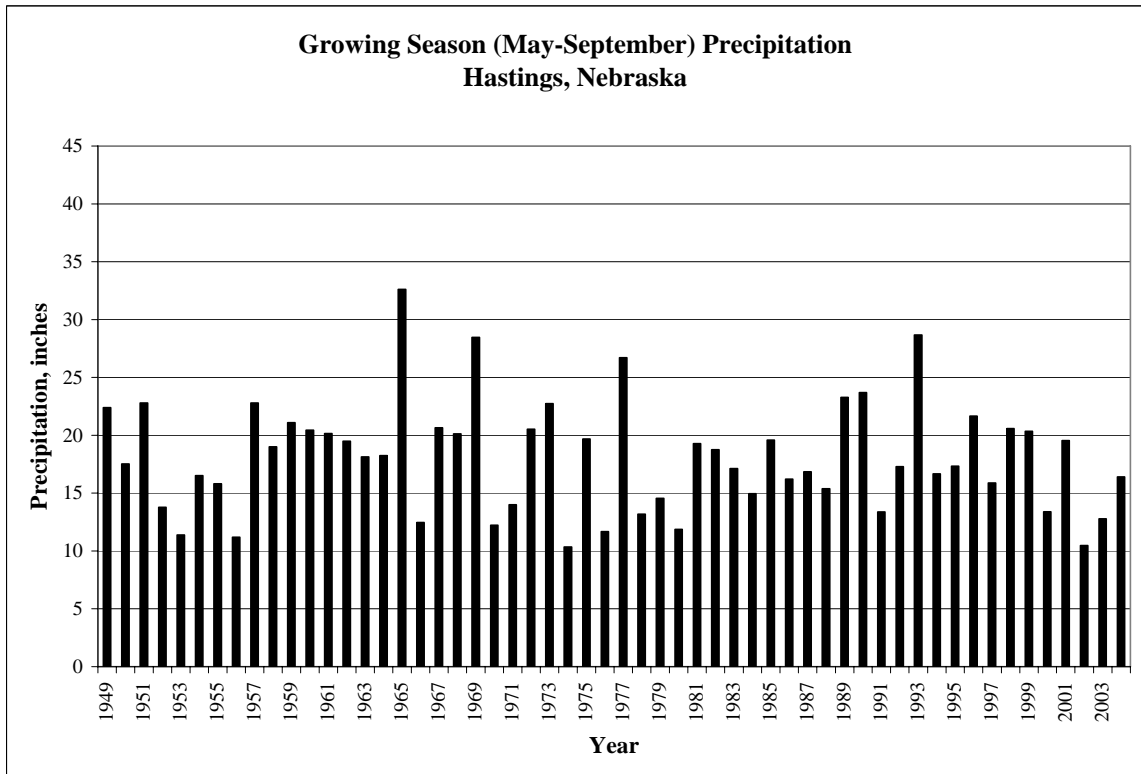


Figure BB-14. Annual Precipitation at Osceola, Nebraska.

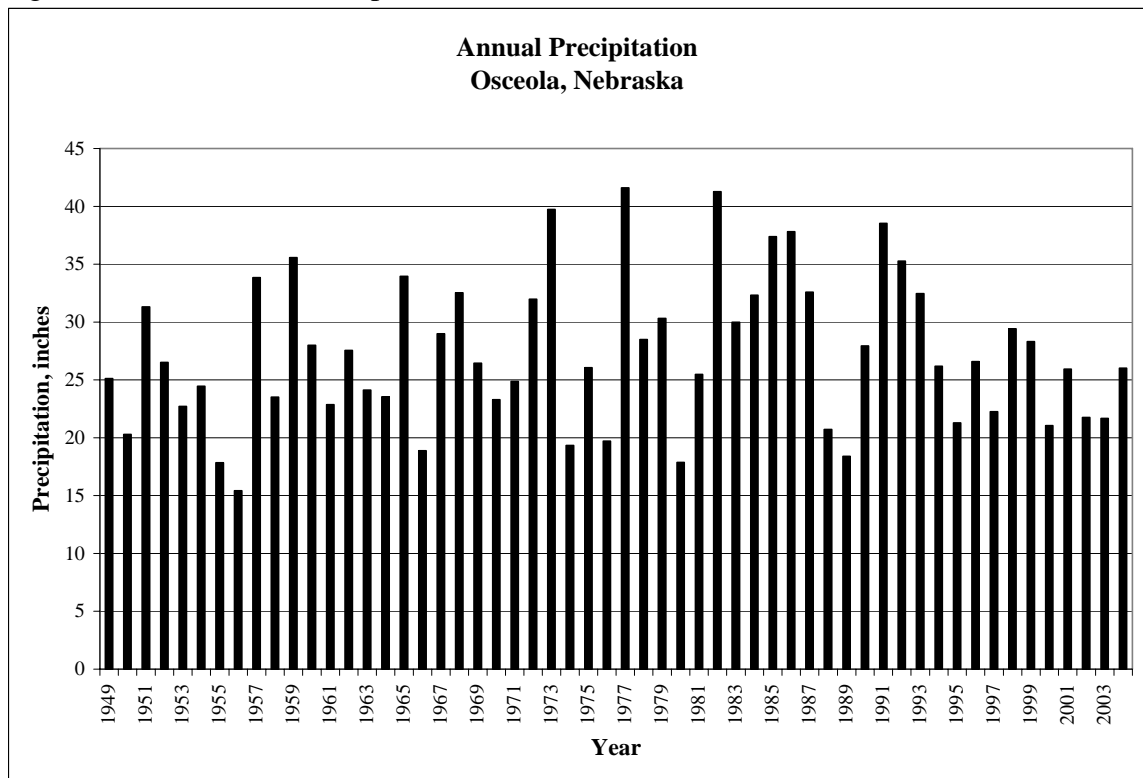


Figure BB-15. Growing Season (May-September) Precipitation at Osceola, Nebraska.

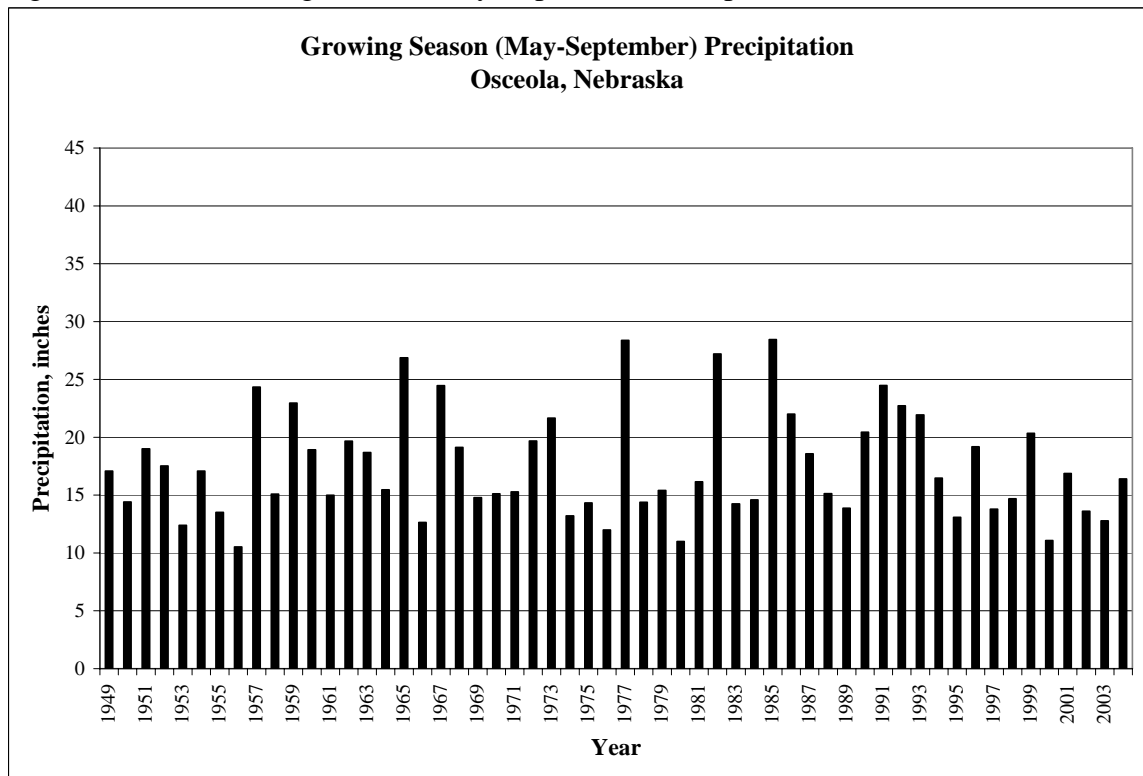


Figure BB-16. Annual Precipitation at Seward, Nebraska.

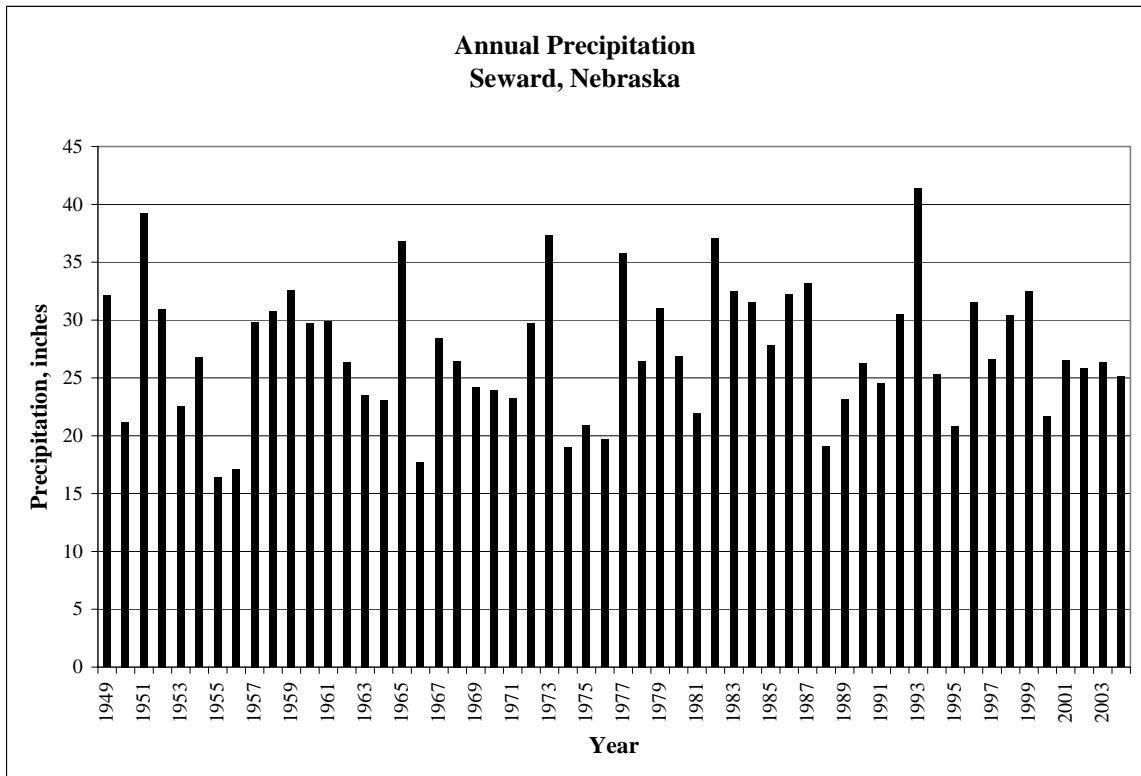


Figure BB-17. Growing Season (May-September) Precipitation at Seward, Nebraska.

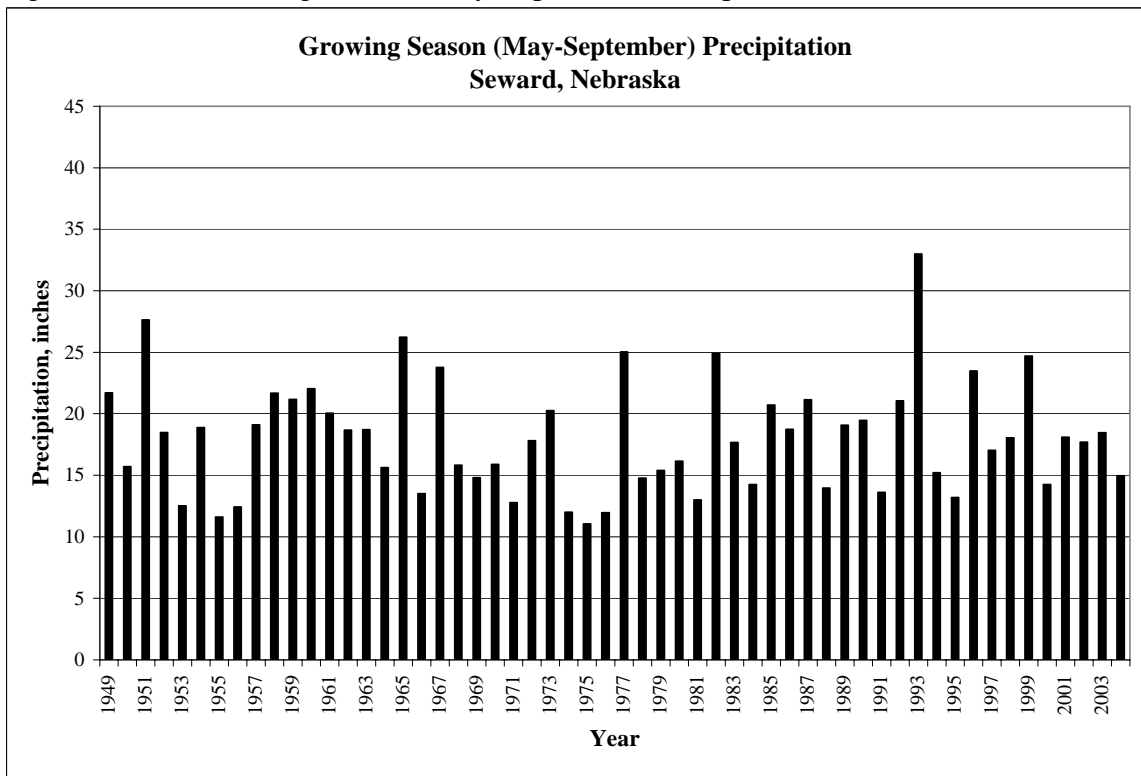


Figure BB-18. Annual Precipitation at York, Nebraska.

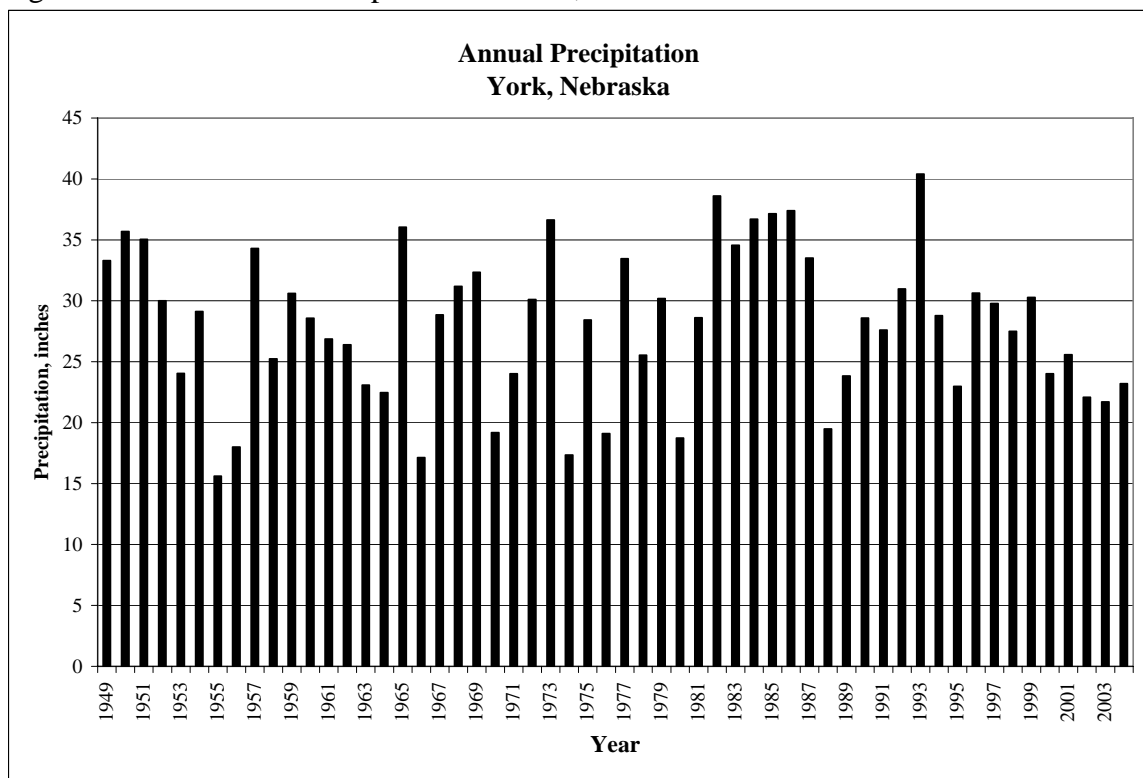
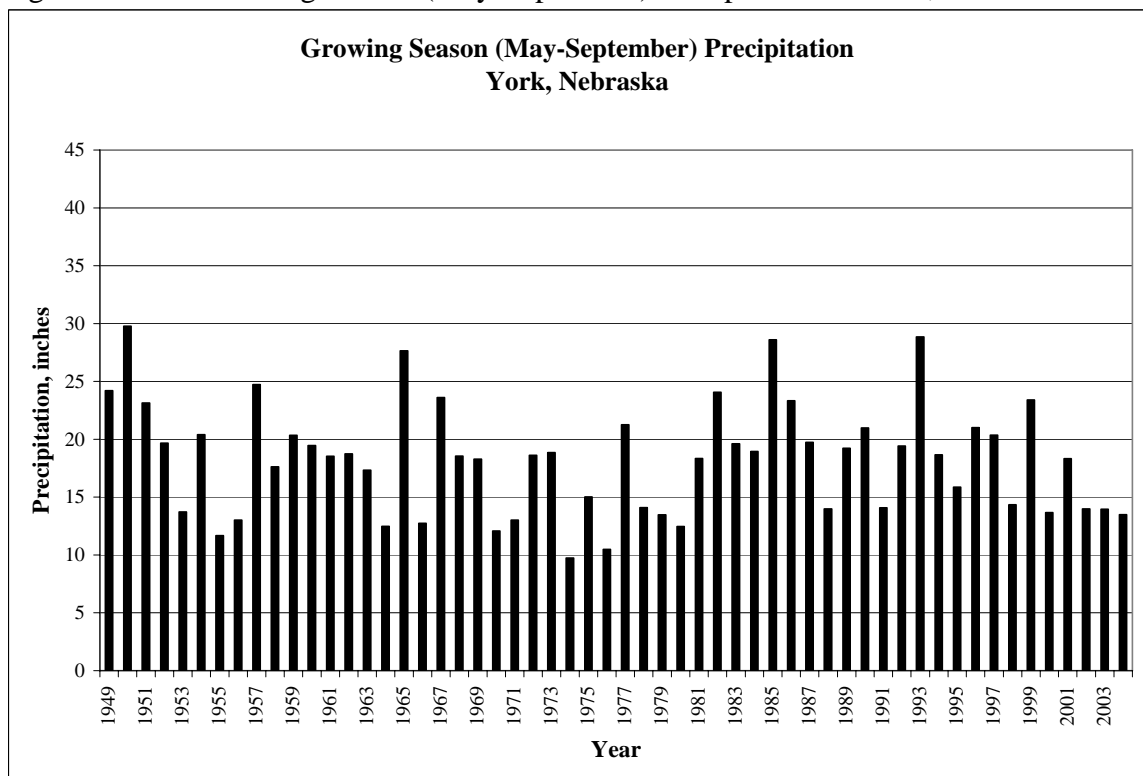


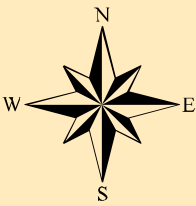
Figure BB-19. Growing Season (May-September) Precipitation at York, Nebraska.





Glacial Till

BIG BLUE RIVER BASIN



Planning and Assistance Division

Explanation

Big Blue Basin

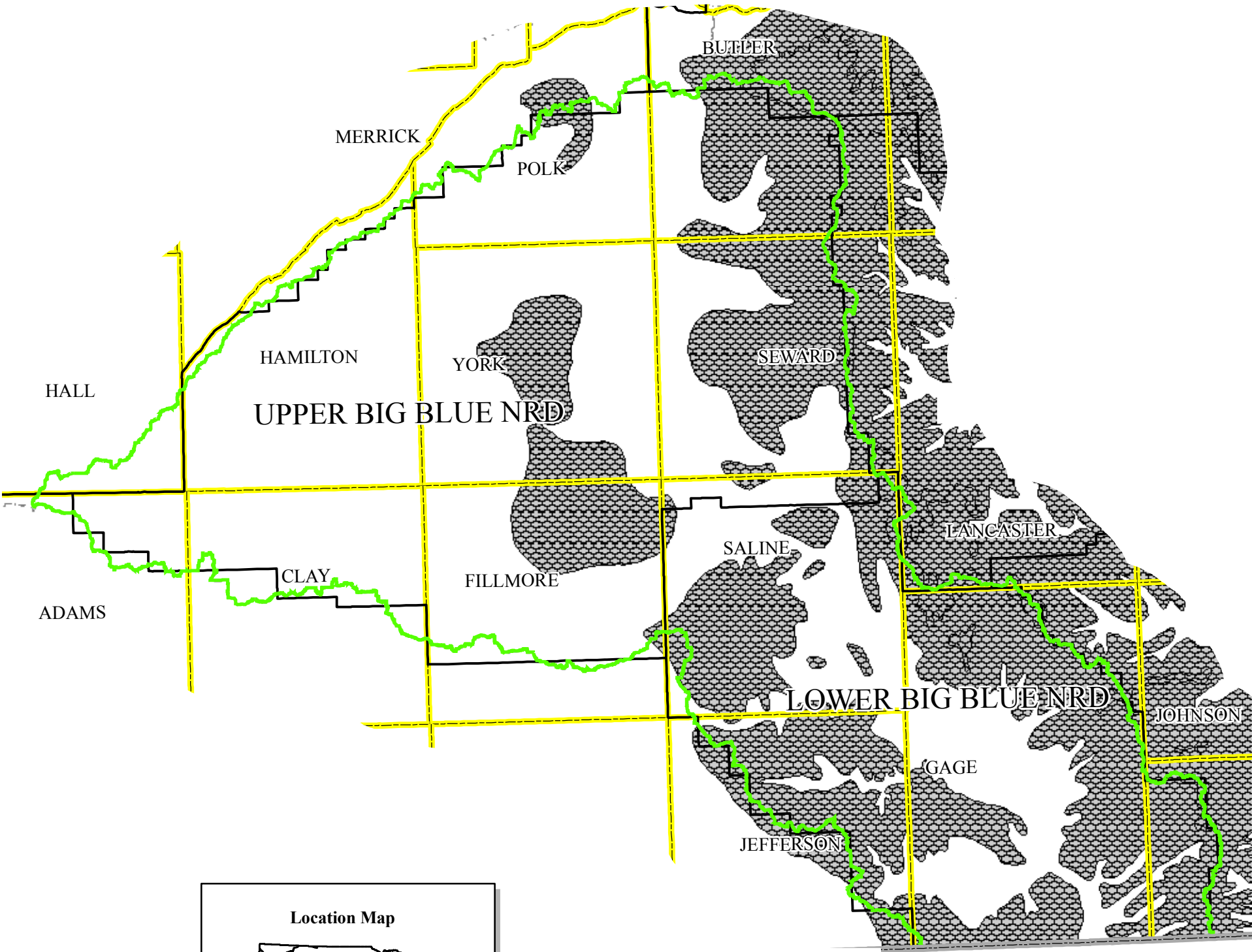
Glacial Till

Cultural Features

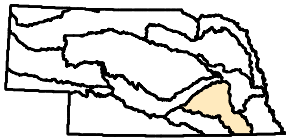
County Boundary

State Boundary

NRD Boundary



Location Map



Glacial till information provided by the UNL Conservation and Survey Division: <http://csd.unl.edu/general/gis-datasets.asp>.

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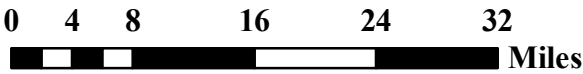


Figure BB-20.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Glacial till map produced by Kevin J. Schwartzman, October 6, 2005

Table BB-1. – Aquifers in unconsolidated surficial deposits, (modified from Keech and Dreeszen, 1959, 1968; Keech, Dreeszen and Emery, 1967; Ellis, 1981; Johnson and Keech, 1959; Verstraeten, McGuire and Heckman, 1998)

System	Hydrogeologic unit	Character and description	Maximum thickness, in feet	Hydrogeologic characteristics
Quaternary	Undifferentiated fluvial and terrace deposits, Todd Valley sand.	Clay, silt, sand and fine gravel; underlie valley-side terraces and valley floor of drainage courses. Sand and gravel valley and terrace deposits, mostly along stream valleys.	30	Generally saturated, wells yield water at a moderate rate.
	Crete Formation, Undifferentiated fluvial, lacustrine and eolian deposits.	Sand and gravel channel-fill deposits. Silt, sand and gravel restricted to broad valleys.	130	Generally saturated where thick and coarse textured, yields water to wells at a high rate.
	Sappa Formation	Stratified deposits of silt, clay sand and gravel.	60	Sand lenses yield water at a slow rate in wells.
	Grand Island Formation	Stream deposited sand and gravel with a persistent aqueous-eolian deposited silt and clay layer.	200	Yields abundant water to wells.
	Red Cloud sand and gravel and Holdrege Formation	Stream deposited sand and gravel with nonpersistent silt and clay, probably of aqueous-eolian origin.	200	Yields abundant water to wells.

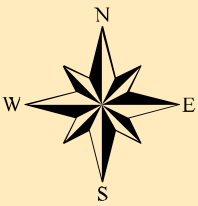
Table BB-2. – Characteristics of bedrock aquifers (modified from Keech and Dreeszen, 1959, 1968; Keech, Dreeszen and Emery, 1967; Ellis, 1981; Johnson and Keech, 1959; Verstraeten, McGuire and Heckman, 1998)

System	Hydrogeologic unit	Character and description	Maximum thickness, in feet	Hydrogeologic characteristics
Tertiary	Ogallala Group	Silt, sandy and clayey silt with lenses of sand and gravels, partly calcareous.	200	Not an important supply of water. May yield sufficient water to domestic wells.
Cretaceous	Niobrara Formation	Chalky shale, weathered in parts	380	Generally not known as a source of water but yields water to wells at a moderate rate where it is fractured.
	Dakota Sandstone	Interbedded clay shale, sandy shale and sandstone.	675	Moderately to highly mineralized water. Sandstone layers yield water at a moderate rate to wells.
Permian	Undifferentiated limestone and shales	Interbedded limestone and shales.	700	Limestone used as minor aquifers, yield water to wells where secondary porosity has developed.



Bedrock Geology

BIG BLUE RIVER BASIN



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Explanation

Big Blue Basin

Bedrock Geology

Ogallala

Pierre

Niobrara

Carlile

Greenhorn-Graneros

Dakota

Chase

Council Grove

Admire

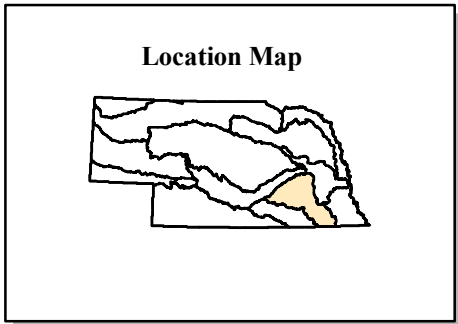
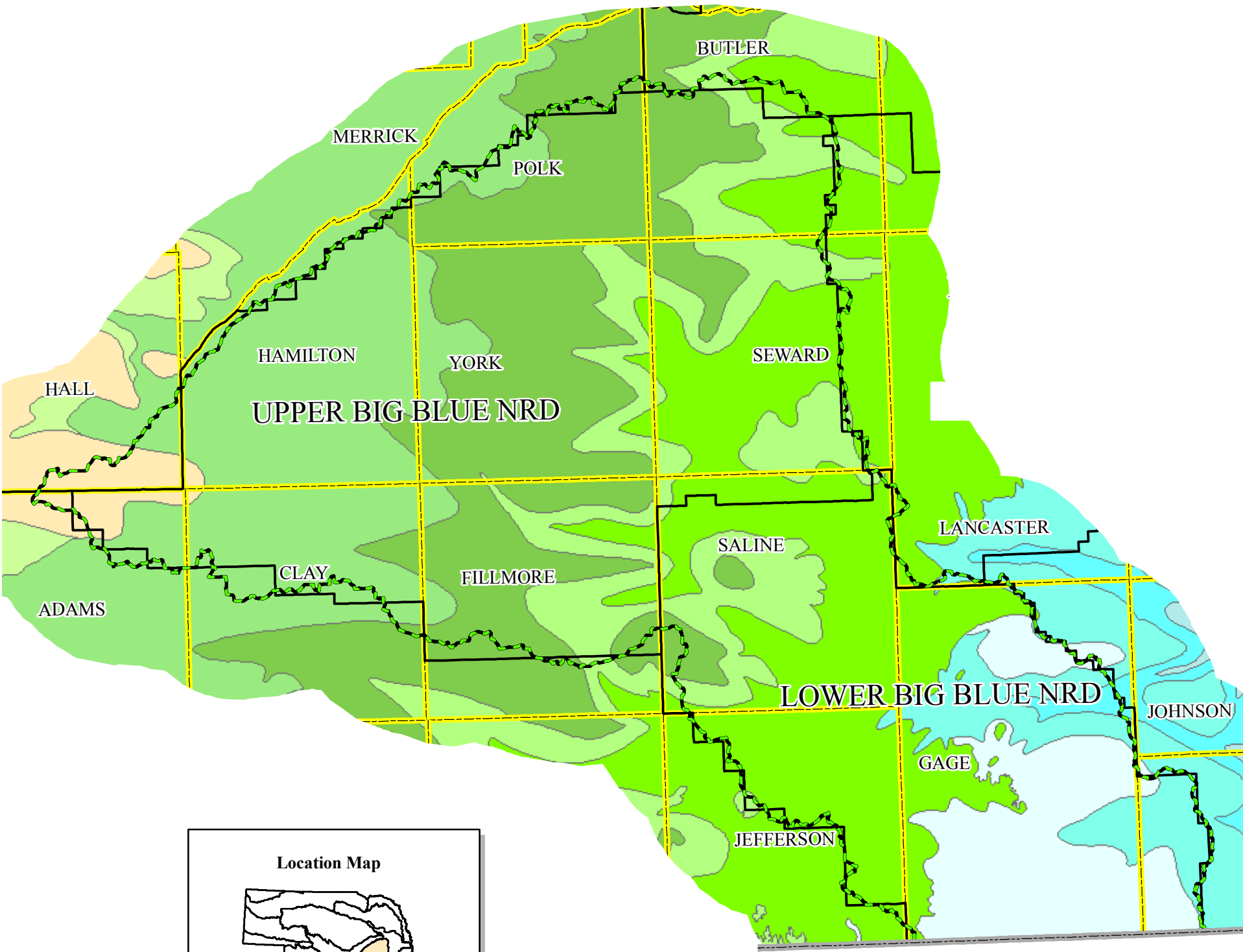
Wabaunsee

Cultural Features

County Boundary

State Boundary

NRD Boundary



Bedrock geology information provided by the
UNL Conservation and Survey Division:
<http://csd.unl.edu/general/gis-datasets.asp>.

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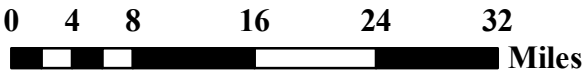


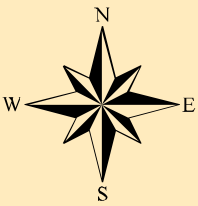
Figure BB-21.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Bedrock geology map produced by Kevin J. Schwartzman, October 6, 2005

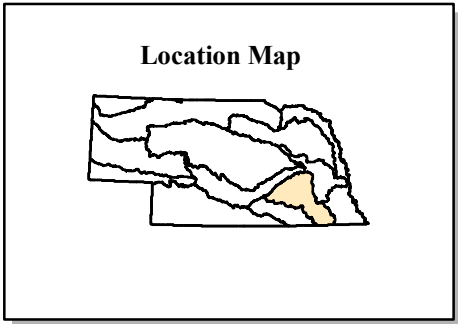
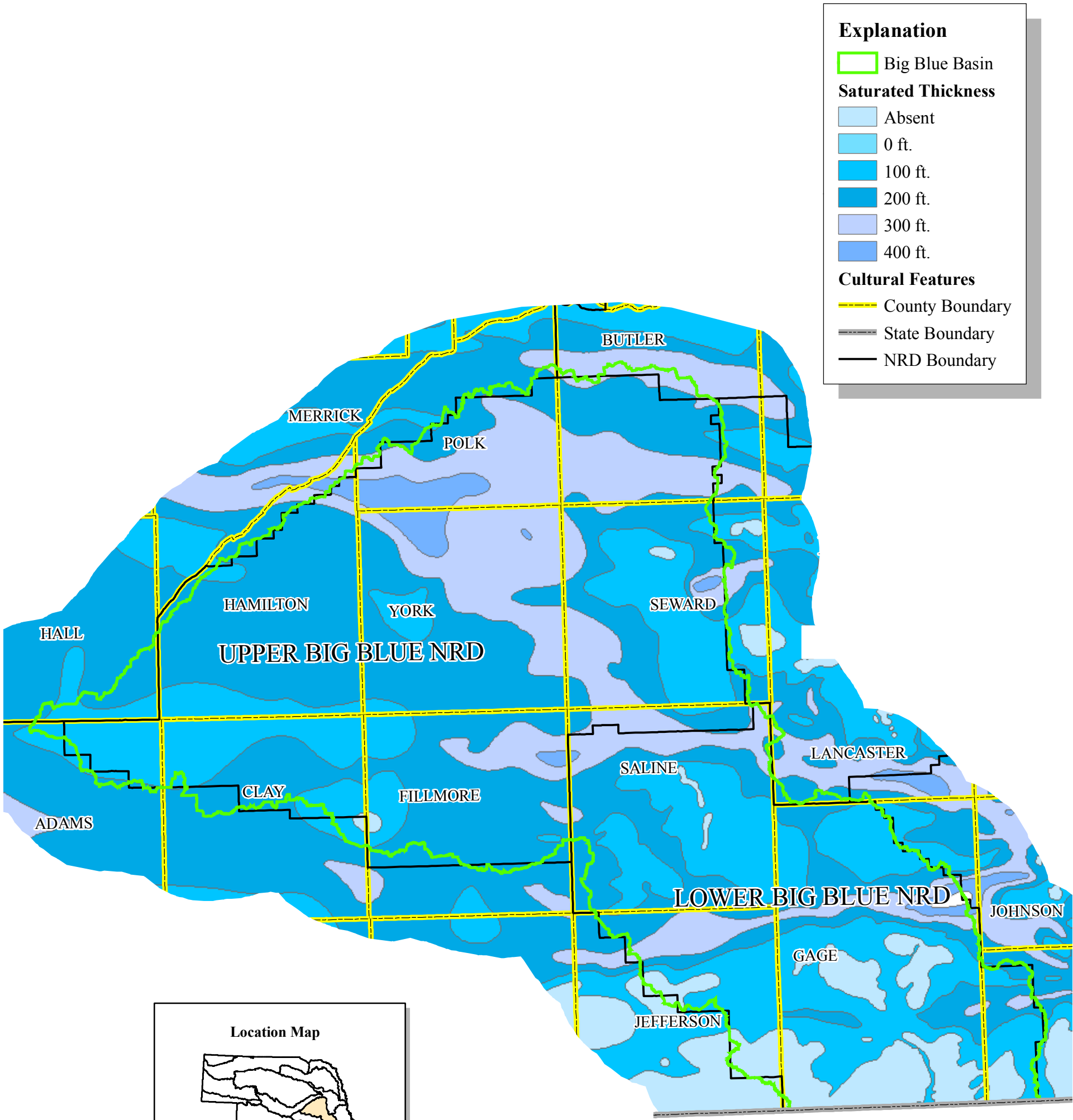


Saturated Thickness

BIG BLUE RIVER BASIN



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Saturated thickness information provided by the UNL Conservation and Survey Division: <http://csd.unl.edu/general/gis-datasets.asp>.

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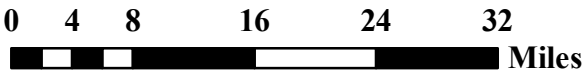


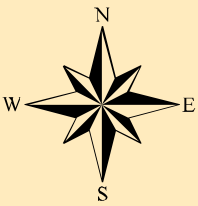
Figure BB-22.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Saturated thickness map produced by Kevin J. Schwartzman, October 6, 2005



Depth To Water

BIG BLUE RIVER BASIN



Planning and Assistance Division

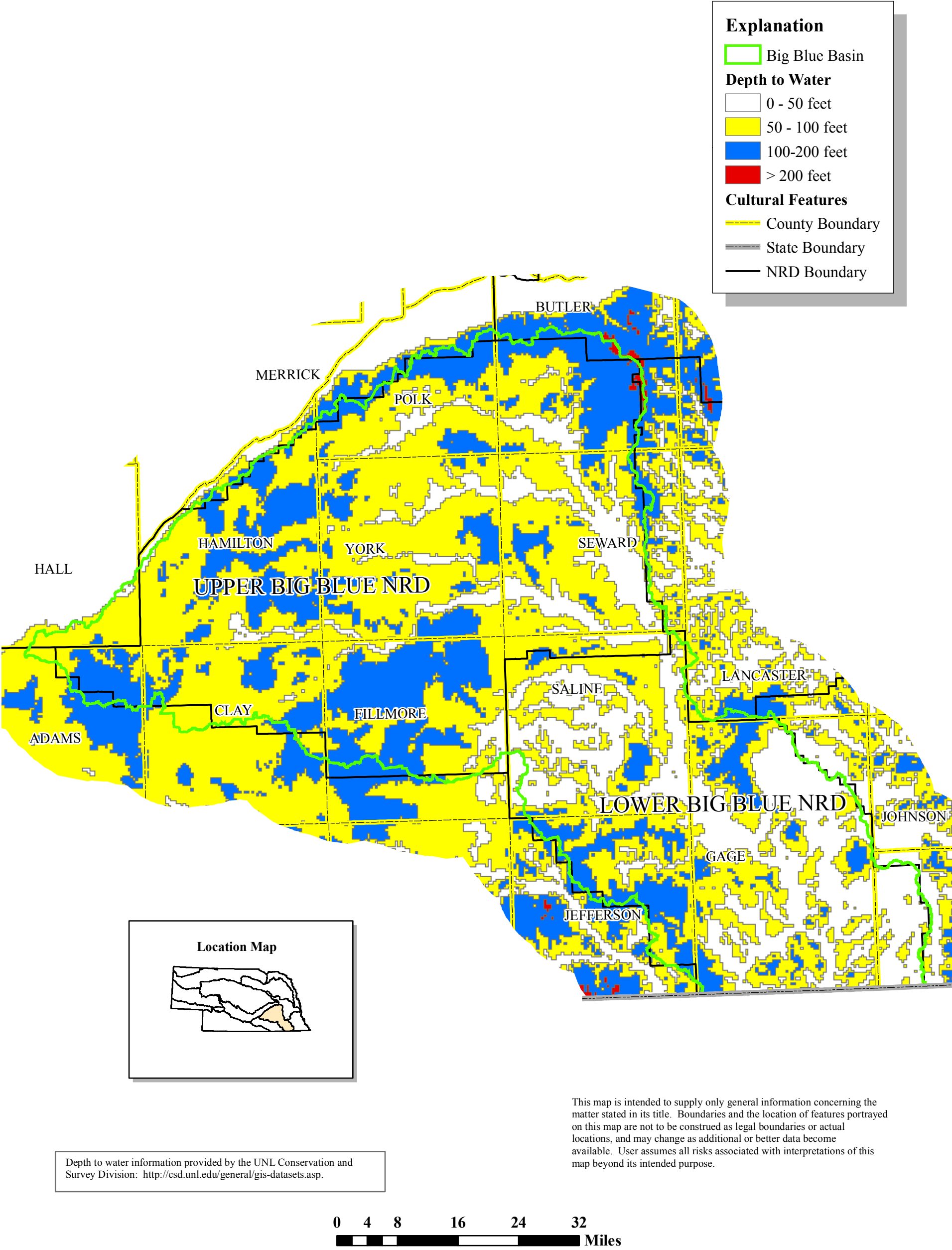


Figure BB-23.

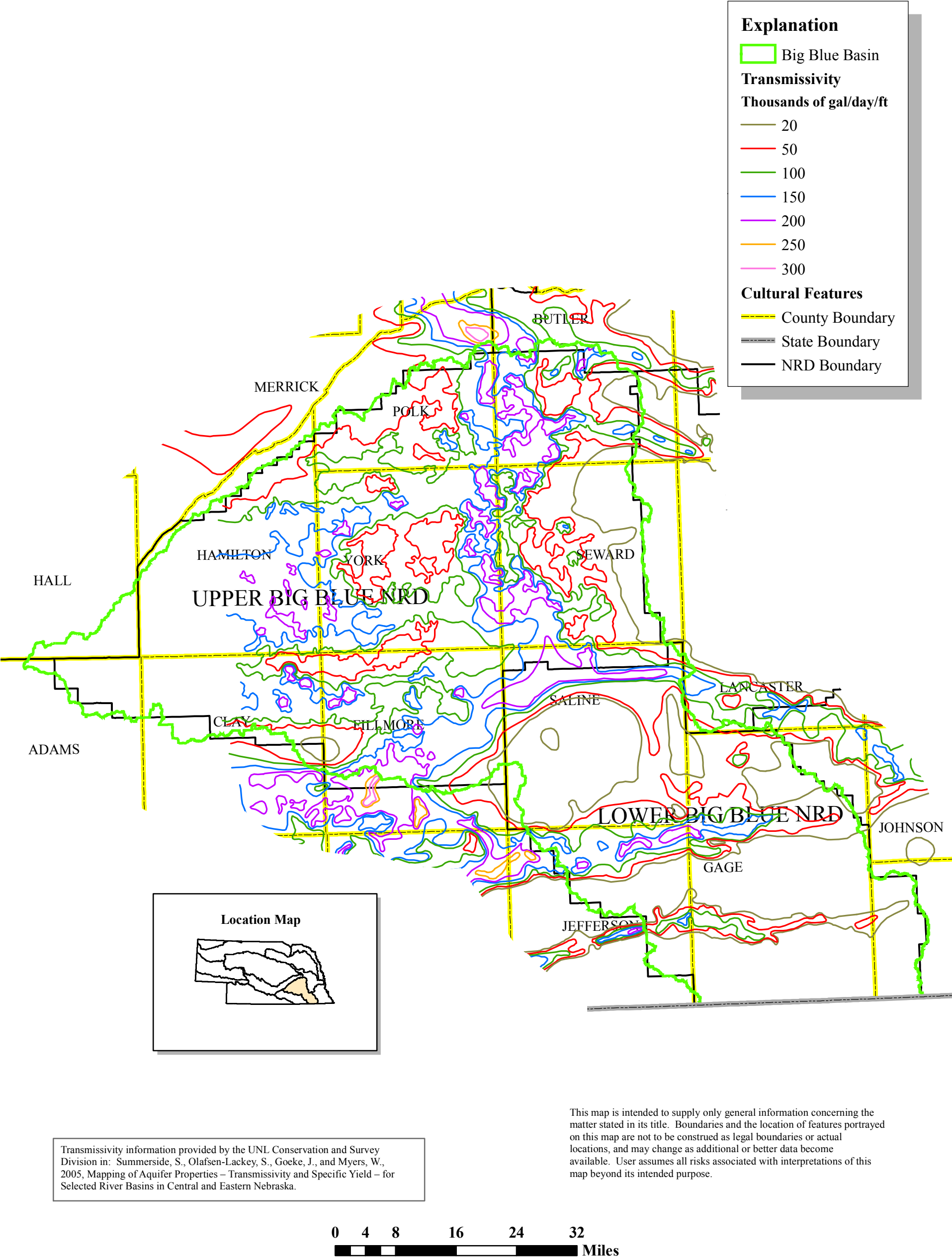
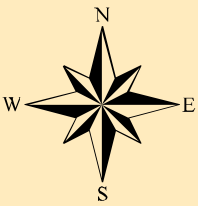
Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Depth to water map produced by Kevin J. Schwartzman, October 6, 2005



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Transmissivity

BIG BLUE RIVER BASIN



Transmissivity information provided by the UNL Conservation and Survey Division in: Summerside, S., Olafsen-Lackey, S., Goeke, J., and Myers, W., 2005, Mapping of Aquifer Properties – Transmissivity and Specific Yield – for Selected River Basins in Central and Eastern Nebraska.

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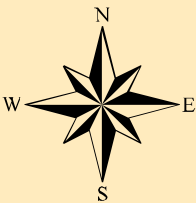
Figure BB-24.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Transmissivity map produced by Kevin J. Schwartzman, October 6, 2005



Specific Yield

BIG BLUE RIVER BASIN



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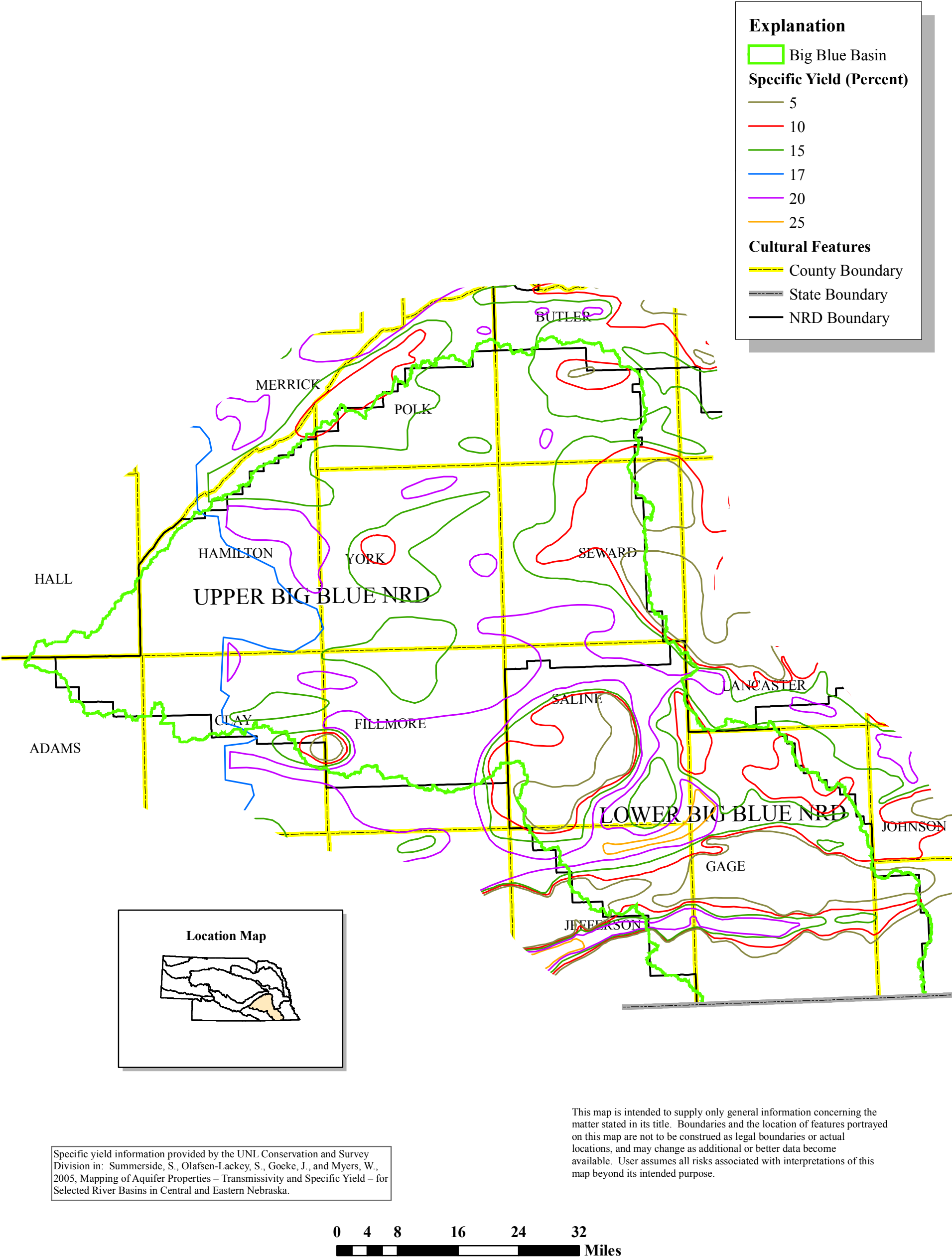


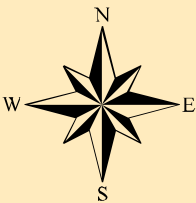
Figure BB-25.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Specific yield map produced by Kevin J. Schwartman, October 6, 2005



1995 Ground Water Table

BIG BLUE RIVER BASIN



Planning and Assistance Division

Explanation

Big Blue Basin

1995 Water Table

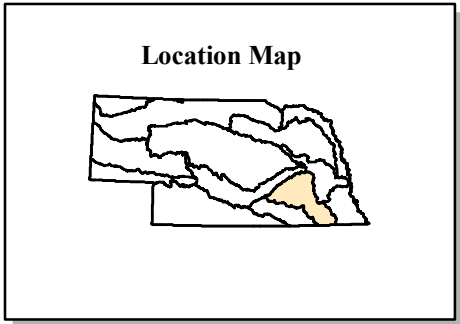
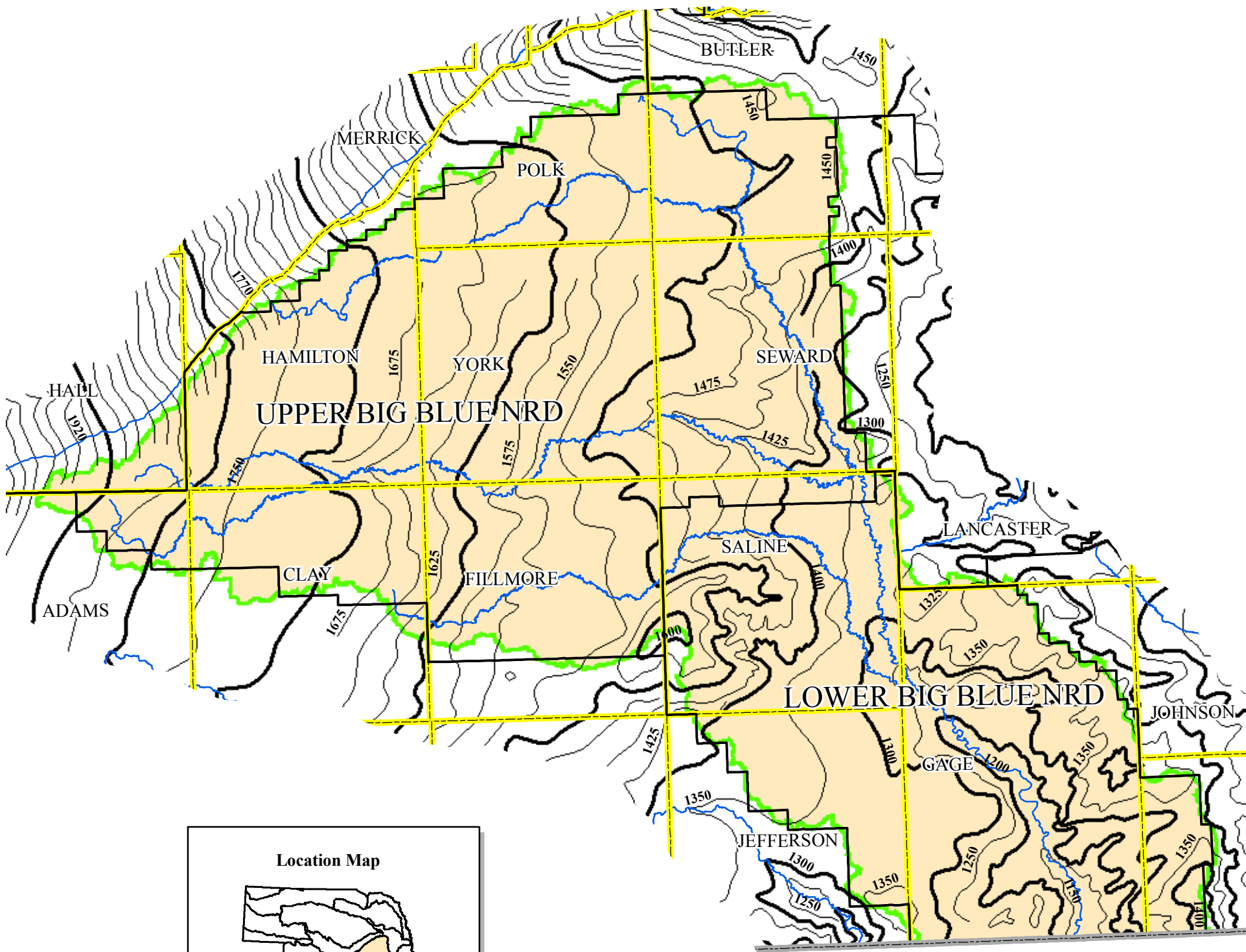
Major Streams

Cultural Features

County Boundary

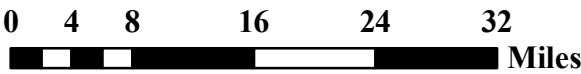
State Boundary

NRD Boundary



Water table information provided by the UNL Conservation and Survey Division: <http://csd.unl.edu/general/gis-datasets.asp>.

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Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Water table map produced by Kevin J. Schwartzman, October 6, 2005

Figure BB-27.

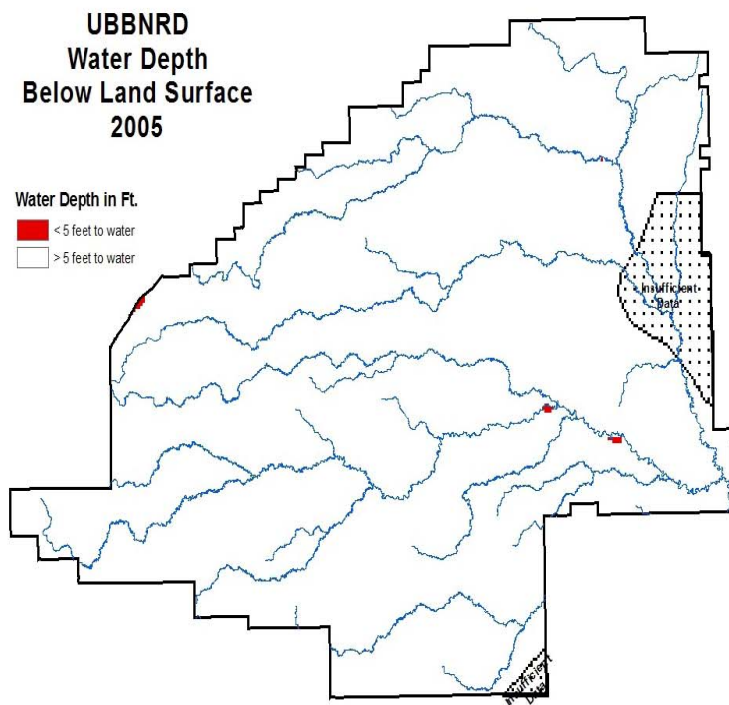


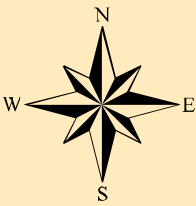
Figure BB-28

GENERAL DEPTH OF GROUNDWATER BELOW LAND SURFACE

Bitner, R.J., 2005



Depletive Ground Water Wells BIG BLUE RIVER BASIN



Planning and Assistance Division

Explanation

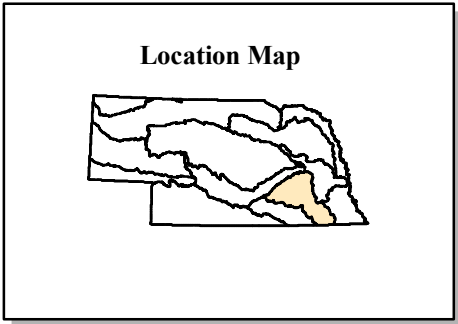
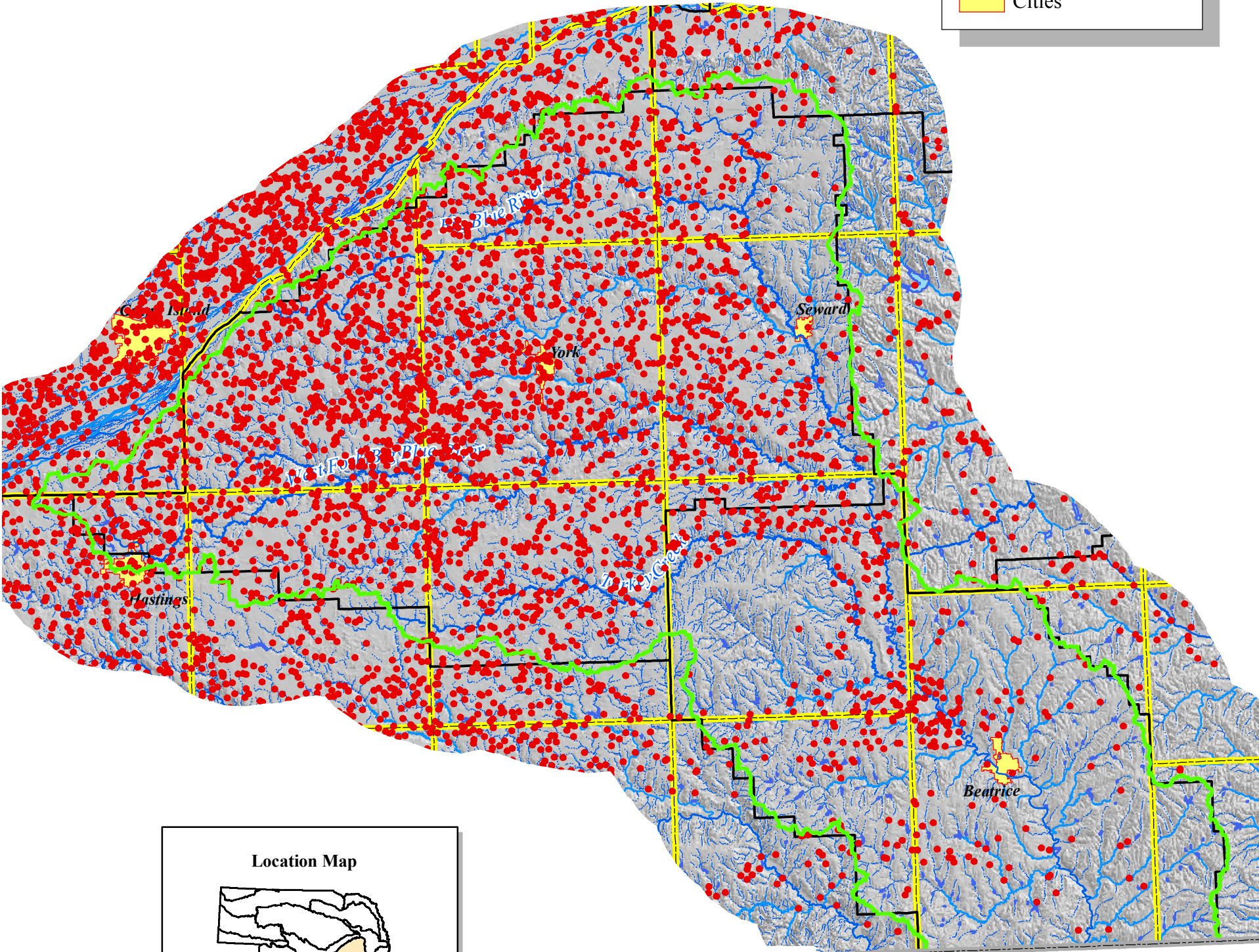
- Depletive Wells

Surface Water Features

- Rivers
- - - Intermittent Streams
- Lakes
- Big Blue Basin

Cultural Features

- - - County Boundary
- - - State Boundary
- Cities



Depletive well information is from the DNR Registered Ground Water Well Database, as of January 2005 and include wells used for aquaculture, commercial, domestic, irrigation, public water supply, dewatering, stock and others except wells for non-consumptive uses.

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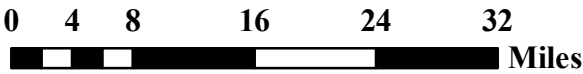


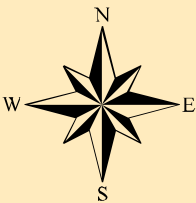
Figure BB-29.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Depletive ground water wells map produced by Shuhai Zheng, October 4, 2005.



High Capacity Wells by Completion Years

BIG BLUE RIVER BASIN



Planning and Assistance Division

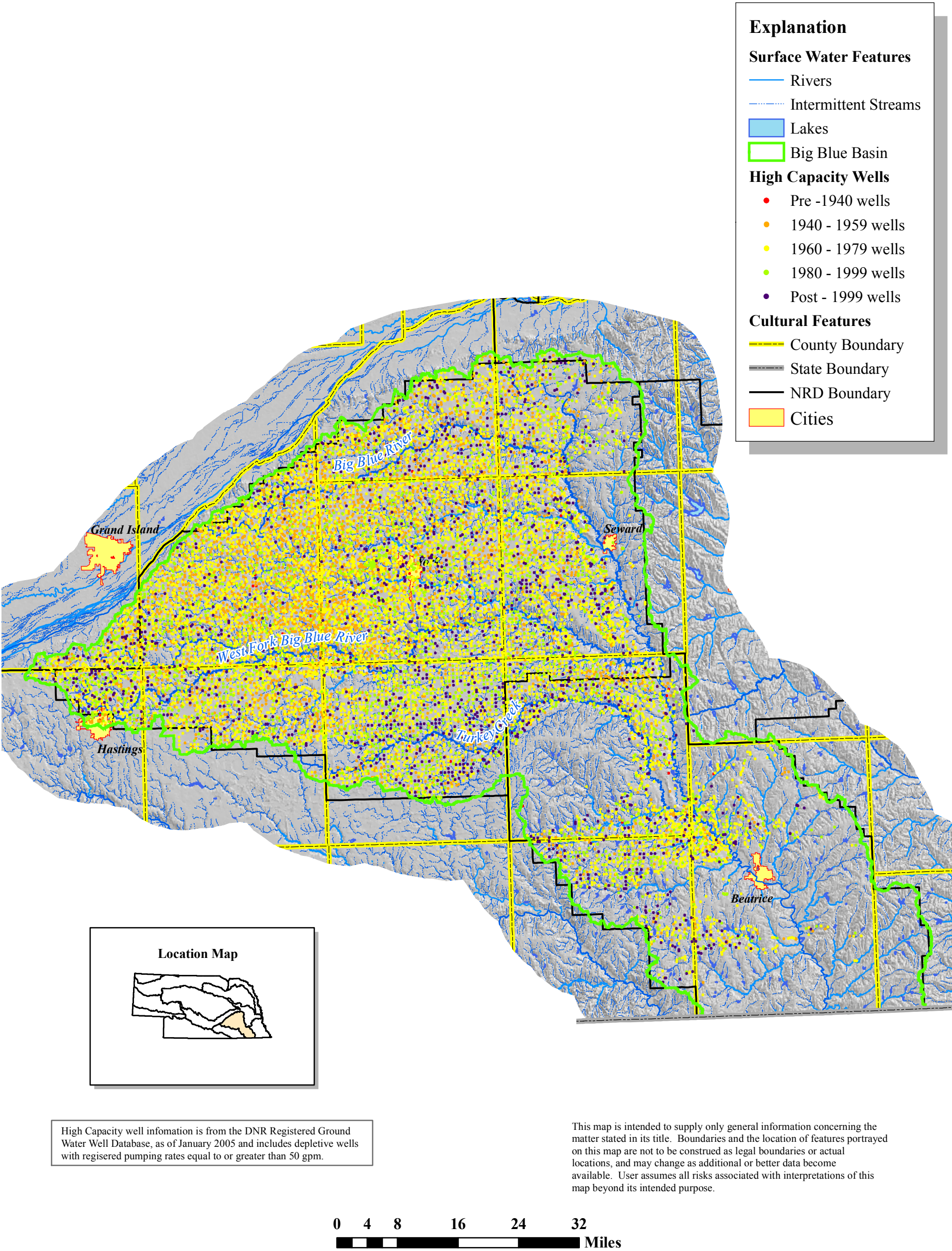
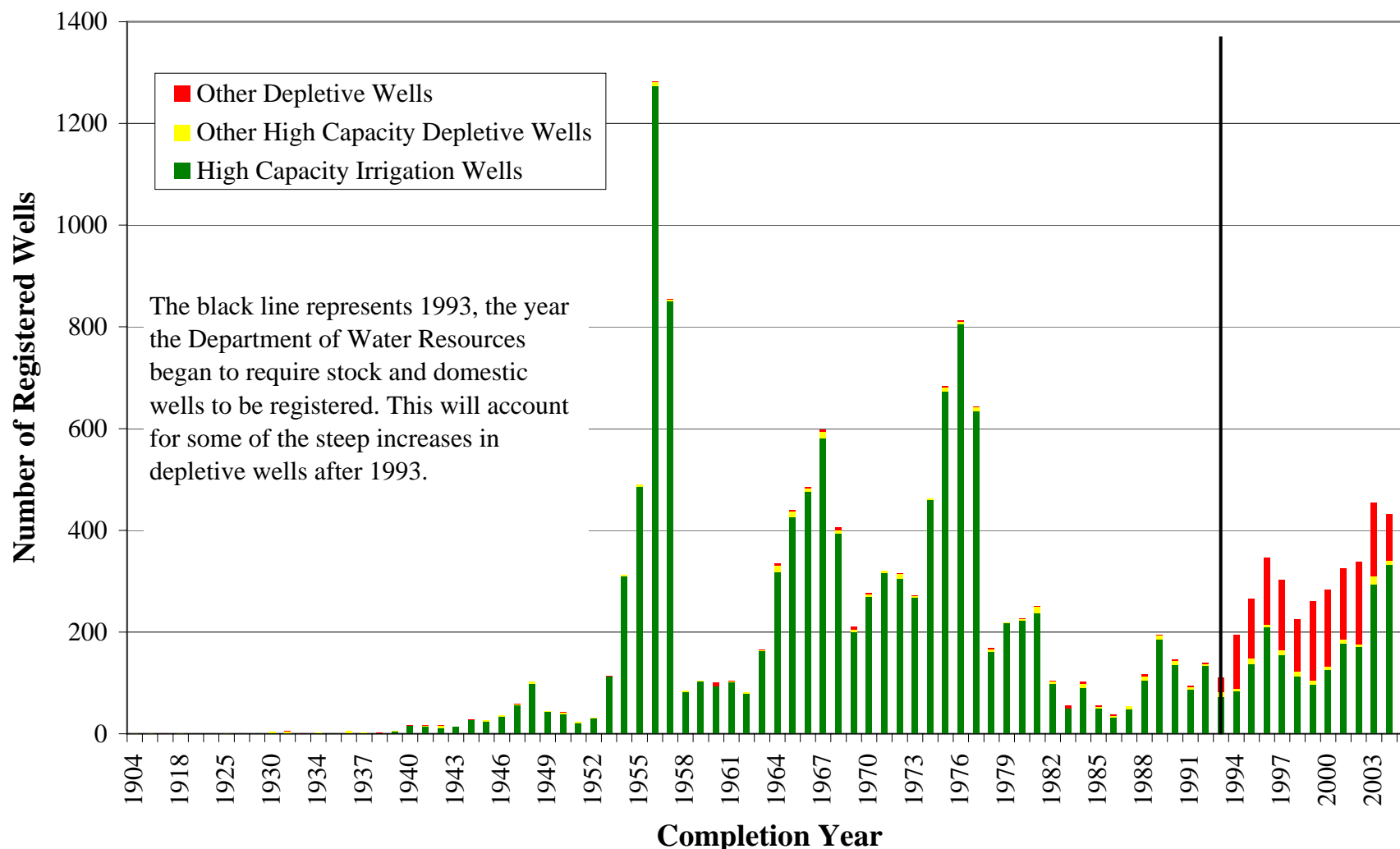


Figure BB-30.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
High capacity wells map produced by Shuhai Zheng, November 10, 2005.

Number of Registered Depletive Wells by Completion Date Big Blue River Basin

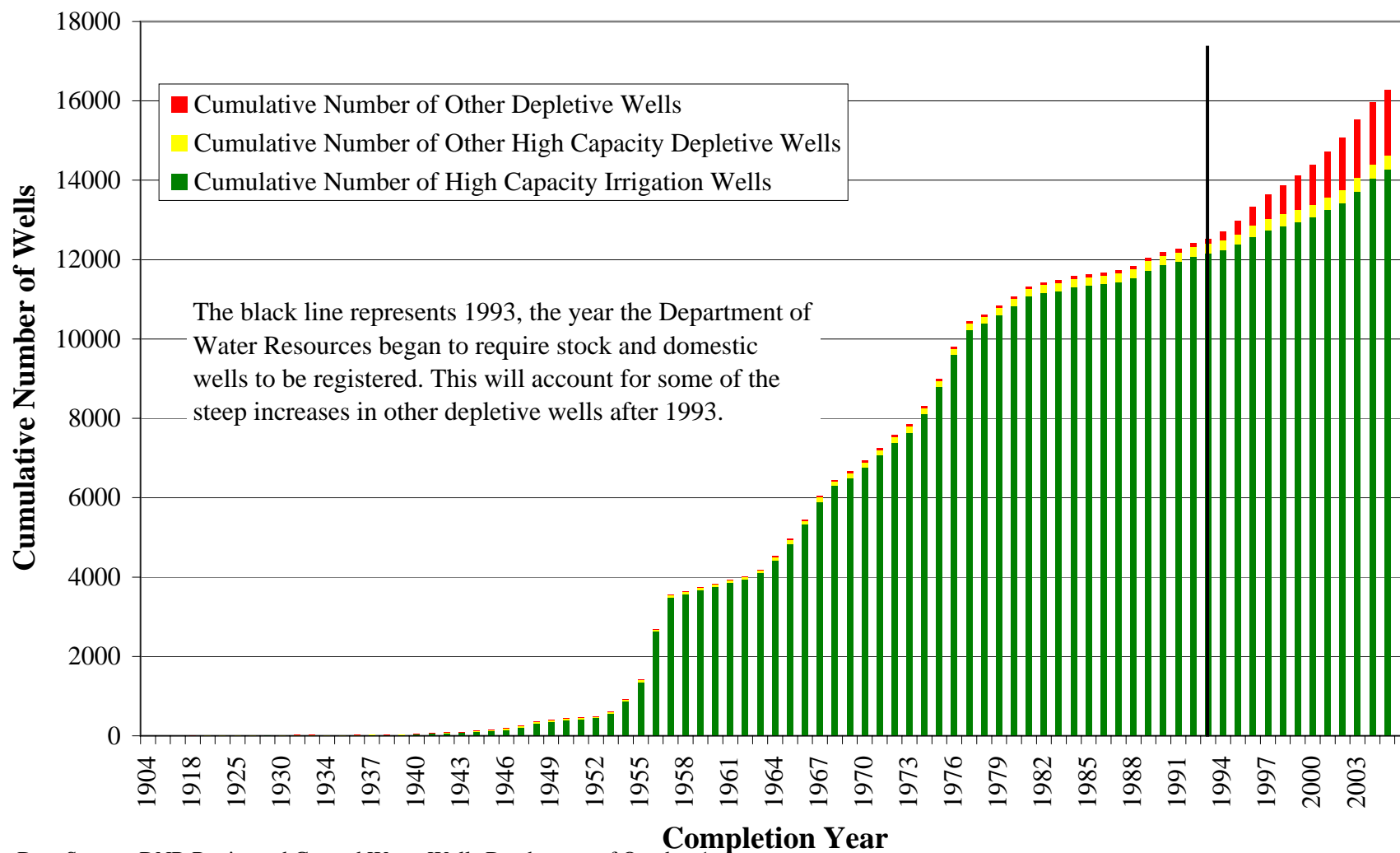


Data Source: DNR Registered Ground Water Wells Database as of October 1, 2005

Figure BB-31

By Shuhai Zheng, 12/6/2005

Cumulative Number of Registered Depletive Wells by Completion Date Big Blue River Basin



Data Source: DNR Registered Ground Water Wells Database as of October 1,

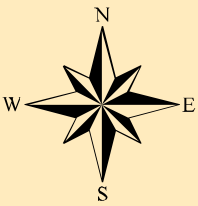
Figure BB-32

By Shuhai Zheng, 12/6/2005



Ground Water-level Changes Pre-development to 2005

BIG BLUE RIVER BASIN



Planning and Assistance Division

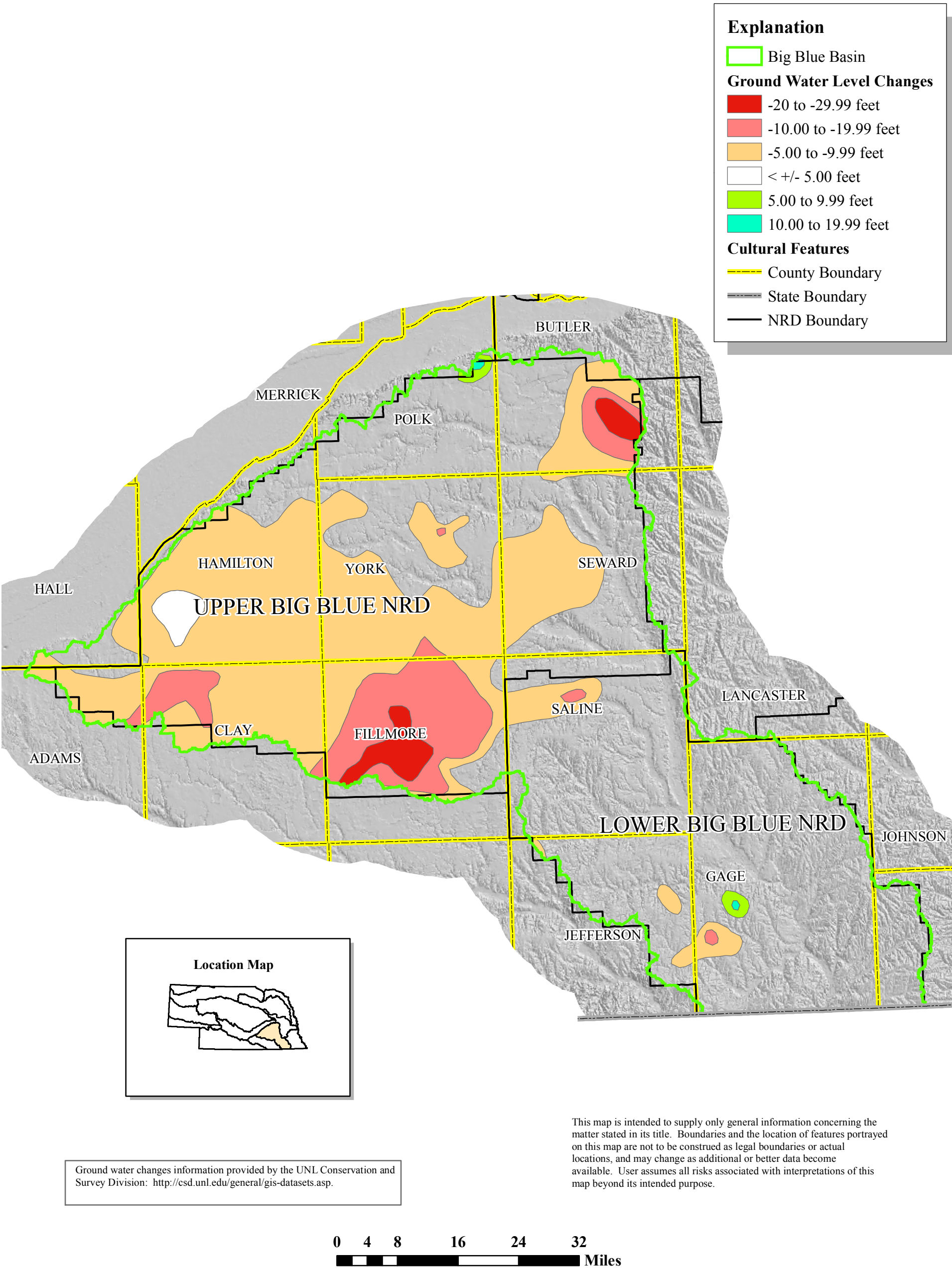


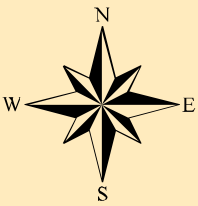
Figure BB-33.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Ground water changes map produced by Shuhai Zheng, October 6, 2005



Hydrograph Locations

BIG BLUE RIVER BASIN



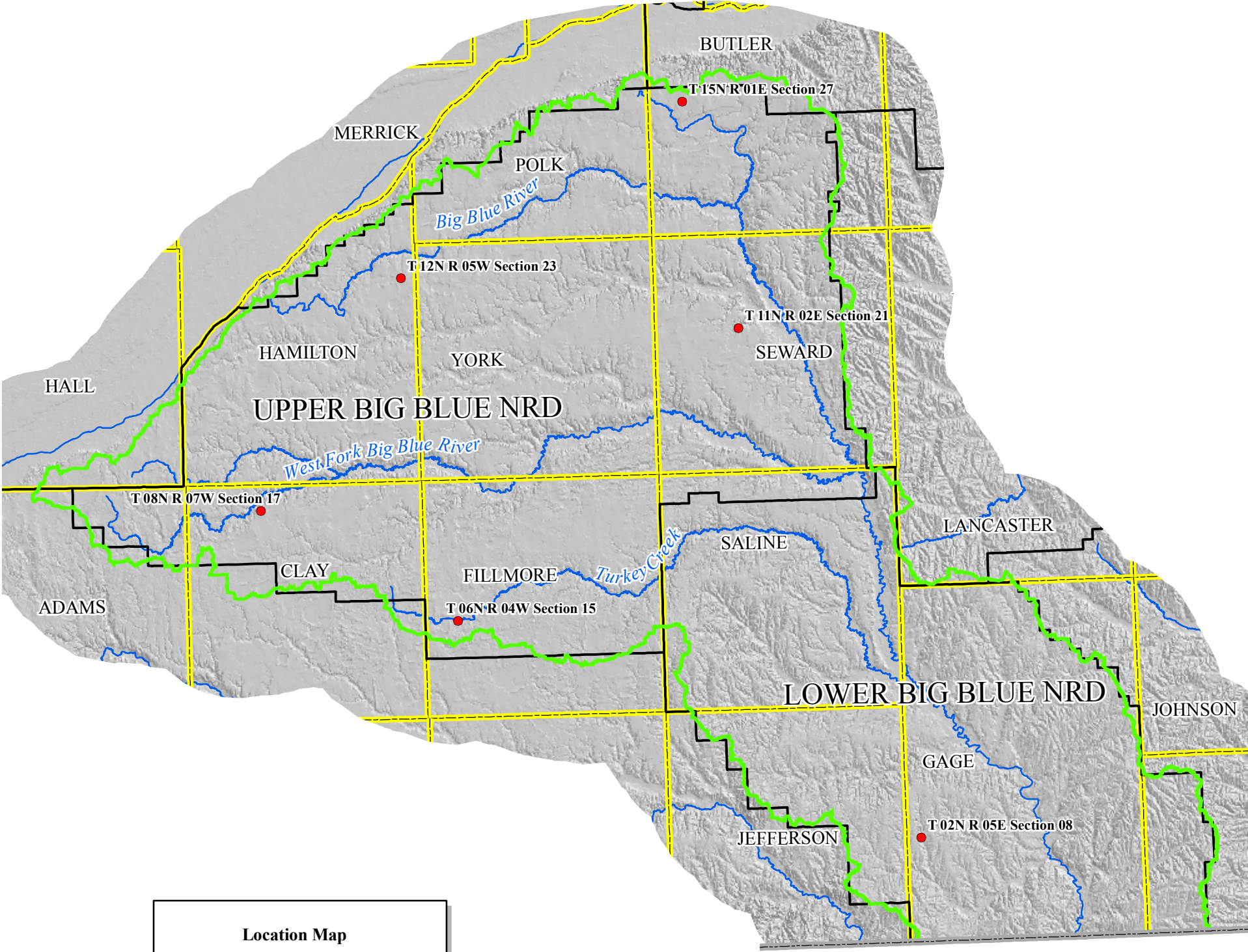
Planning and Assistance Division

Explanation

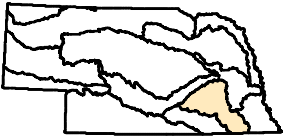
- Big Blue Basin
- Well Hydrographs

Cultural Features

- County Boundary
- State Boundary
- NRD Boundary



Location Map



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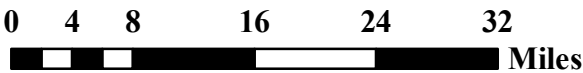
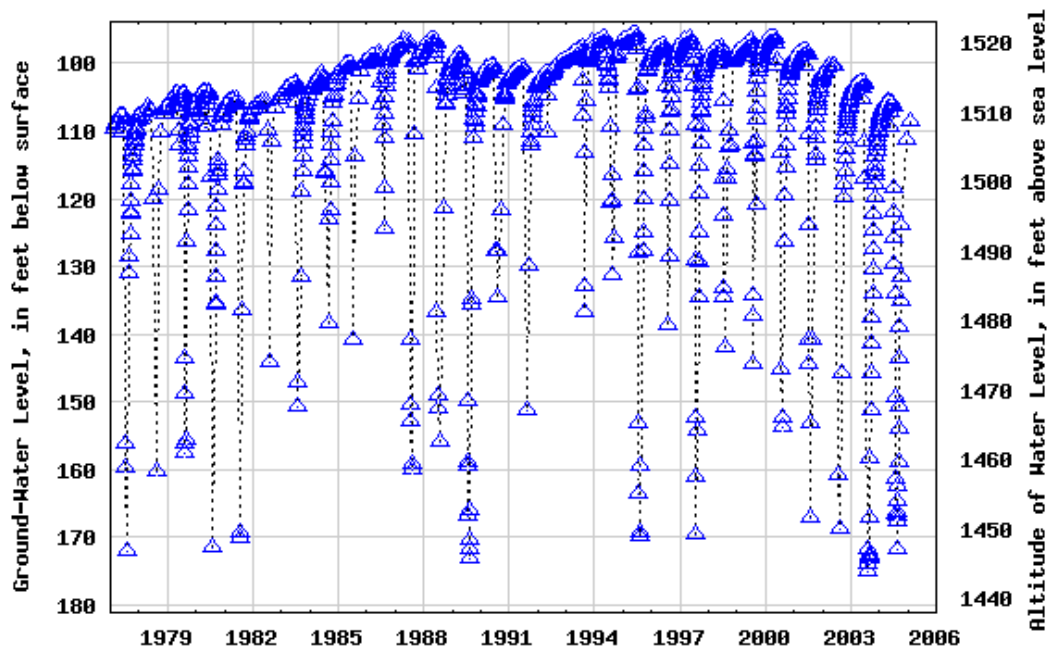


Figure BB-34.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Precipitation gages map produced by Kevin Schwartman, November 1, 2005.



USGS 411420097173002 15N 1E27DDDD2



Provisional Data Subject to Revision

Butler County, Nebraska

Hydrologic Unit Code 10220003

Latitude 41°14'10", Longitude 97°17'30" NAD83

Land-surface elevation 1,618.00 feet above sea level NGVD29

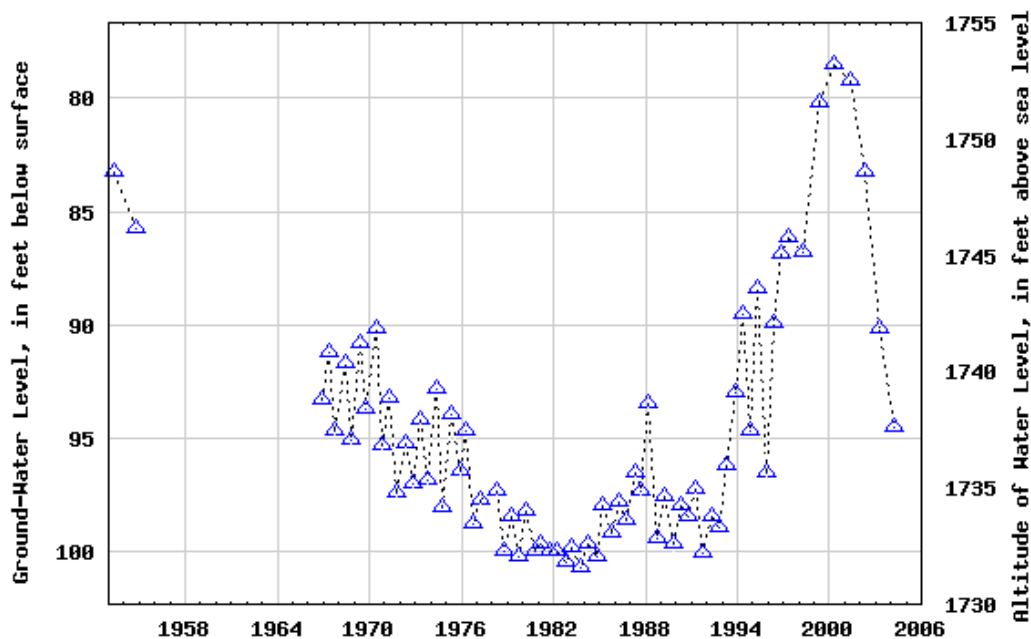
The depth of the well is 210 feet below land surface.

This well is completed in the QUATERNARY SAND AND GRAVEL DEPOSITS (112SDGV) local aquifer.

Figure BB-35



USGS 403923098082501 8N 7W17CD 1



Provisional Data Subject to Revision

Clay County, Nebraska

Hydrologic Unit Code 10270203

Latitude 40°39'23", Longitude 98°08'25" NAD27

Land-surface elevation 1,832. feet above sea level NGVD29

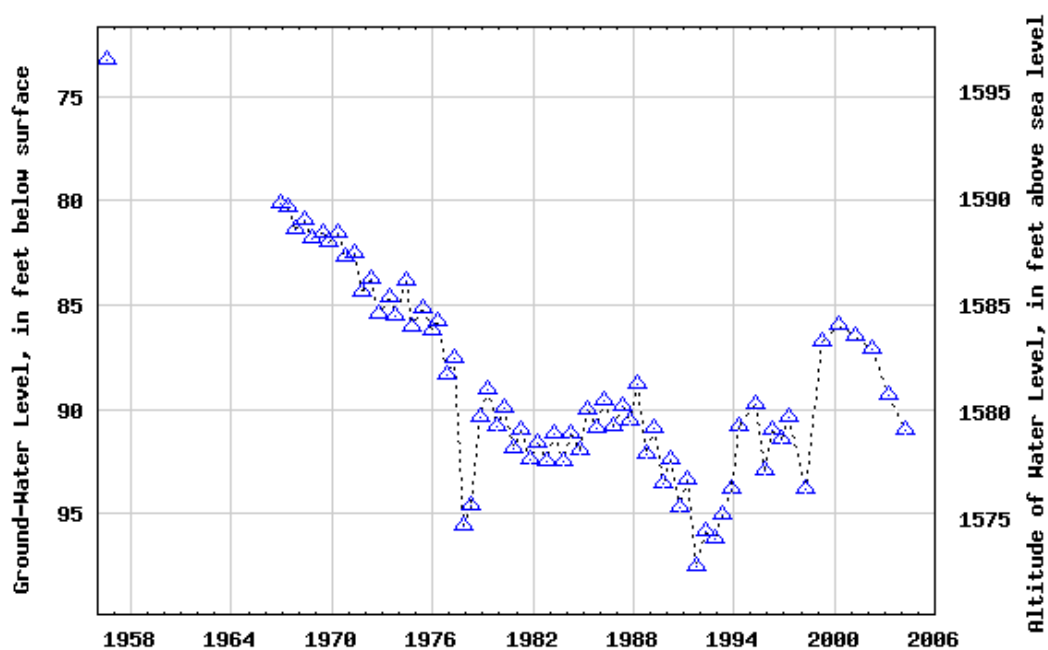
The depth of the well is 165 feet below land surface.

This well is completed in the QUATERNARY SAND AND GRAVEL DEPOSITS (112SDGV) local aquifer.

Figure BB-36



USGS 402935097454701 6N 4W15BB 1



Provisional Data Subject to Revision

Fillmore County, Nebraska

Hydrologic Unit Code 10270204

Latitude 40°29'35", Longitude 97°45'47" NAD27

Land-surface elevation 1,670. feet above sea level NGVD29

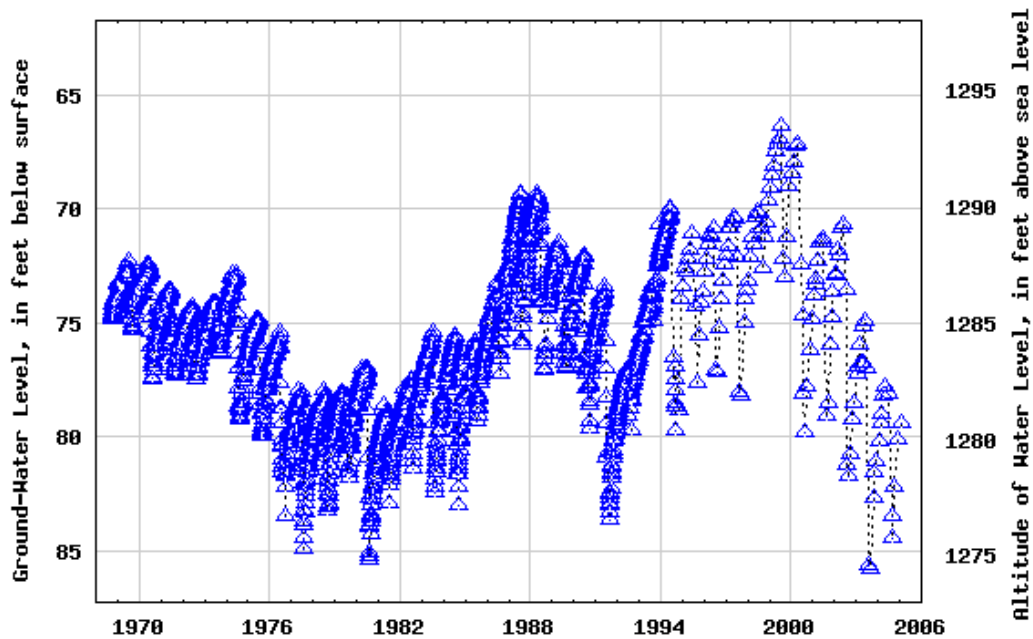
The depth of the well is 180 feet below land surface.

This well is completed in the QUATERNARY SAND AND GRAVEL DEPOSITS (112SDGV) local aquifer.

Figure BB-37



USGS 400917096525101 2N 5E 8AD 1

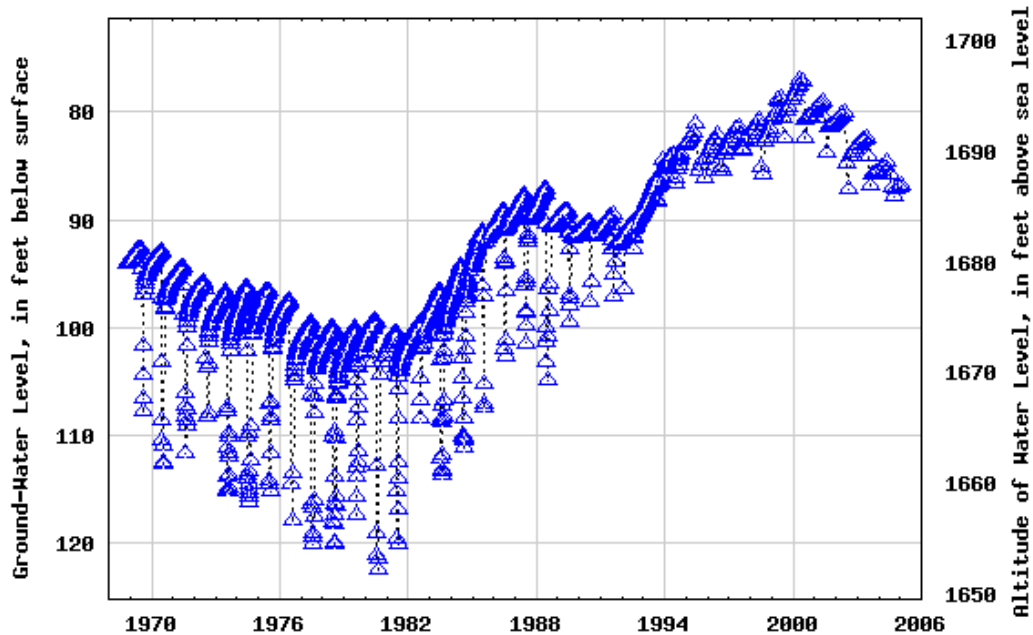


Gage County, Nebraska
Hydrologic Unit Code 10270202
Latitude 40°09'17", Longitude 96°52'51" NAD27
Land-surface elevation 1,360.00 feet above sea level NGVD29
The depth of the well is 167 feet below land surface.
This well is completed in the QUATERNARY SAND AND GRAVEL DEPOSITS (112SDGV) local aquifer.

Figure BB-38



USGS 405921097514701 12N 5W23CCC 1



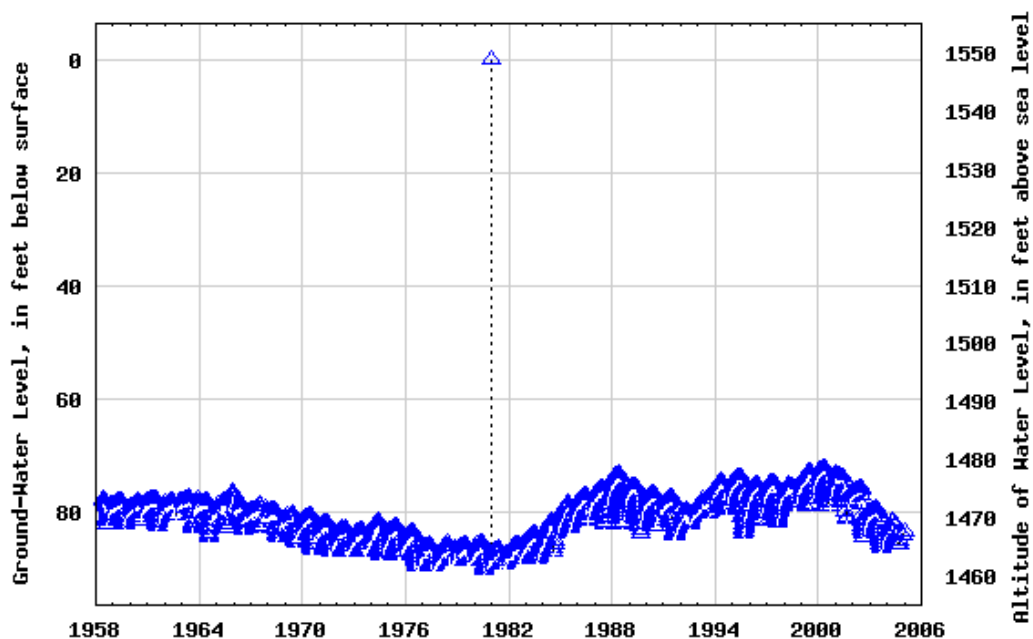
Provisional Data Subject to Revision

Hamilton County, Nebraska
Hydrologic Unit Code 10270201
Latitude 40°59'21", Longitude 97°51'47" NAD27
Land-surface elevation 1,774. feet above sea level NGVD29
The depth of the well is 189 feet below land surface.
This well is completed in the QUATERNARY SAND AND GRAVEL DEPOSITS (112SDGV) local aquifer.

Figure BB-39



USGS 405406097115001 11N 2E21DD 1



Provisional Data Subject to Revision

Seward County, Nebraska

Hydrologic Unit Code 10270201

Latitude 40°54'06", Longitude 97°11'50" NAD27

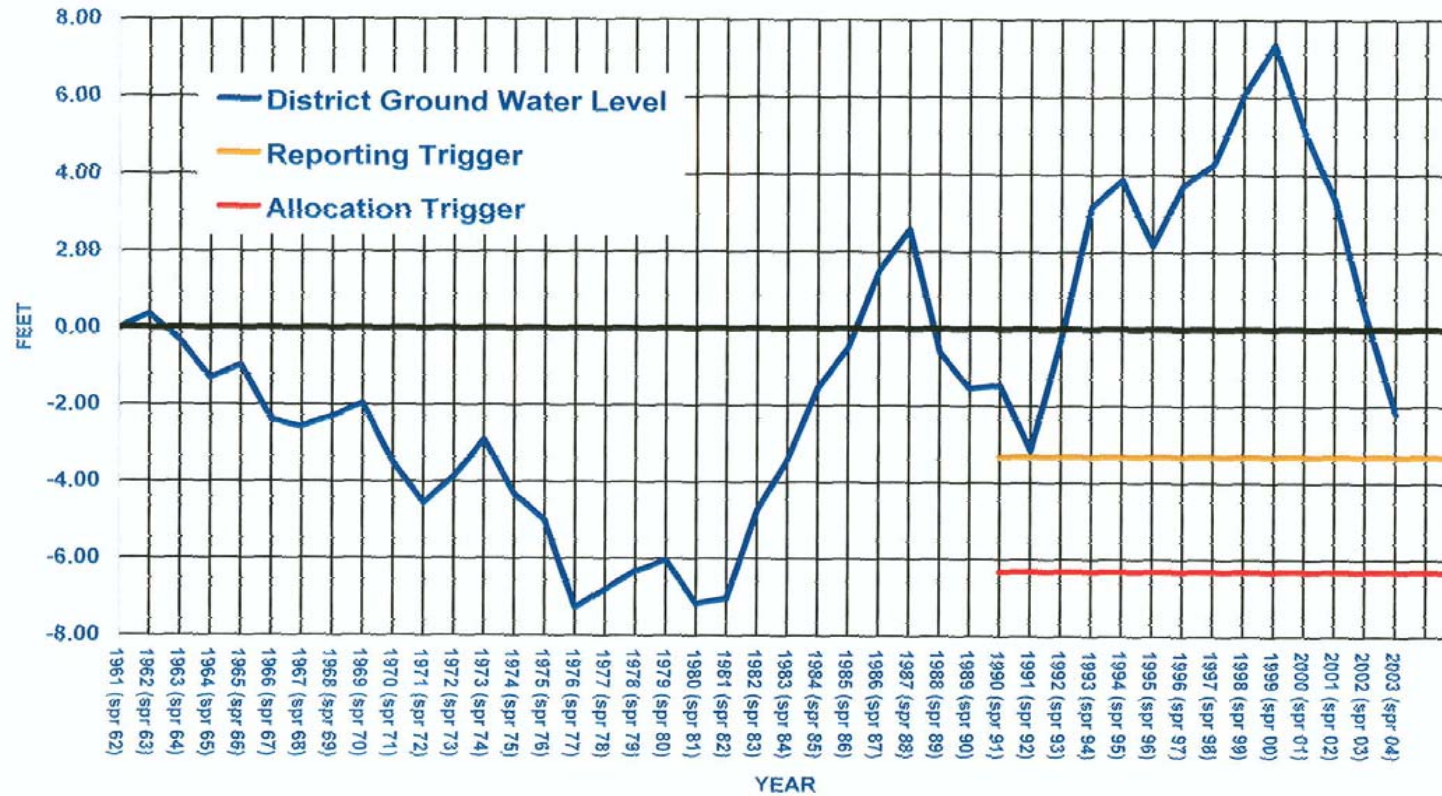
Land-surface elevation 1,550. feet above sea level NGVD29

The depth of the well is 123 feet below land surface.

This well is completed in the QUATERNARY SAND AND GRAVEL DEPOSITS (112SDGV) local aquifer.

Figure BB-40

UPPER BIG BLUE NRD - AVERAGE GROUND WATER LEVELS TRIGGERS COMPARED TO HISTORIC LEVELS SPRING 2004



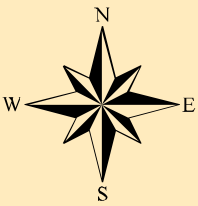
The Spring 2003 ground water level is 1.14 ft. above the reporting trigger and 4.14 ft. above the allocation trigger

Figure BB-41



Stream Gages

BIG BLUE RIVER BASIN



Planning and Assistance Division

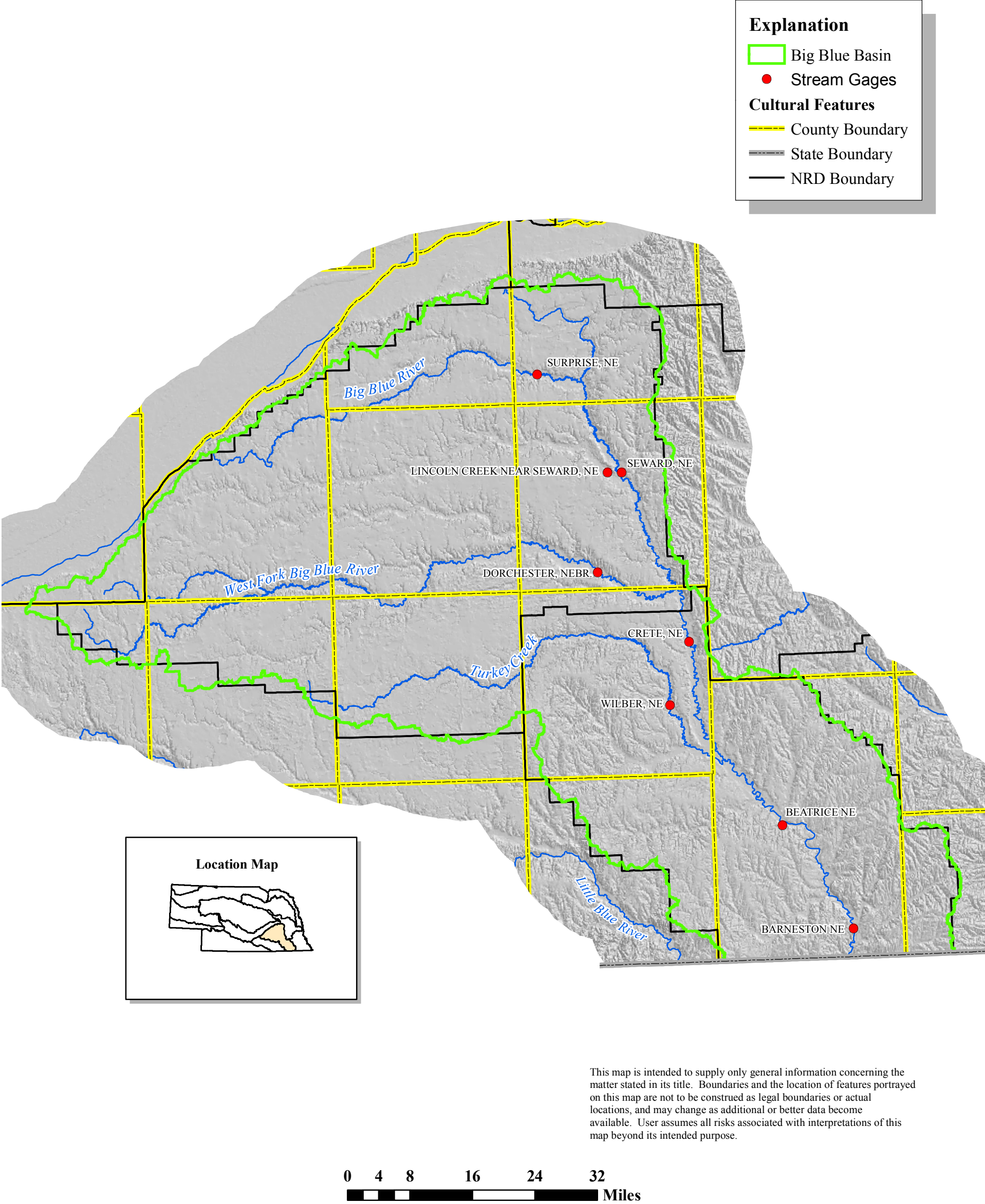


Figure BB-42.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Stream gages map produced by Jeff Shafer, October 18, 2005.

Figure BB-43. Annual Flows, Lincoln Creek near Seward.

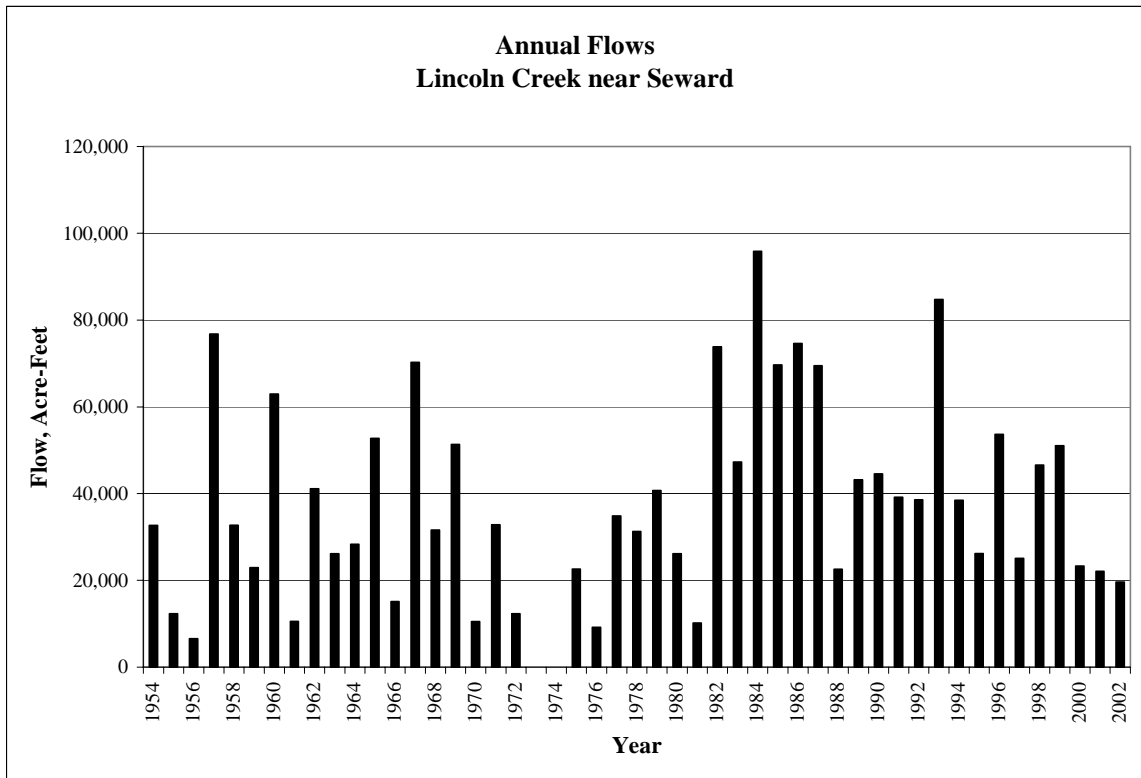


Figure BB-44. Annual Flows, West Fork of the Big Blue River near Dorchester.

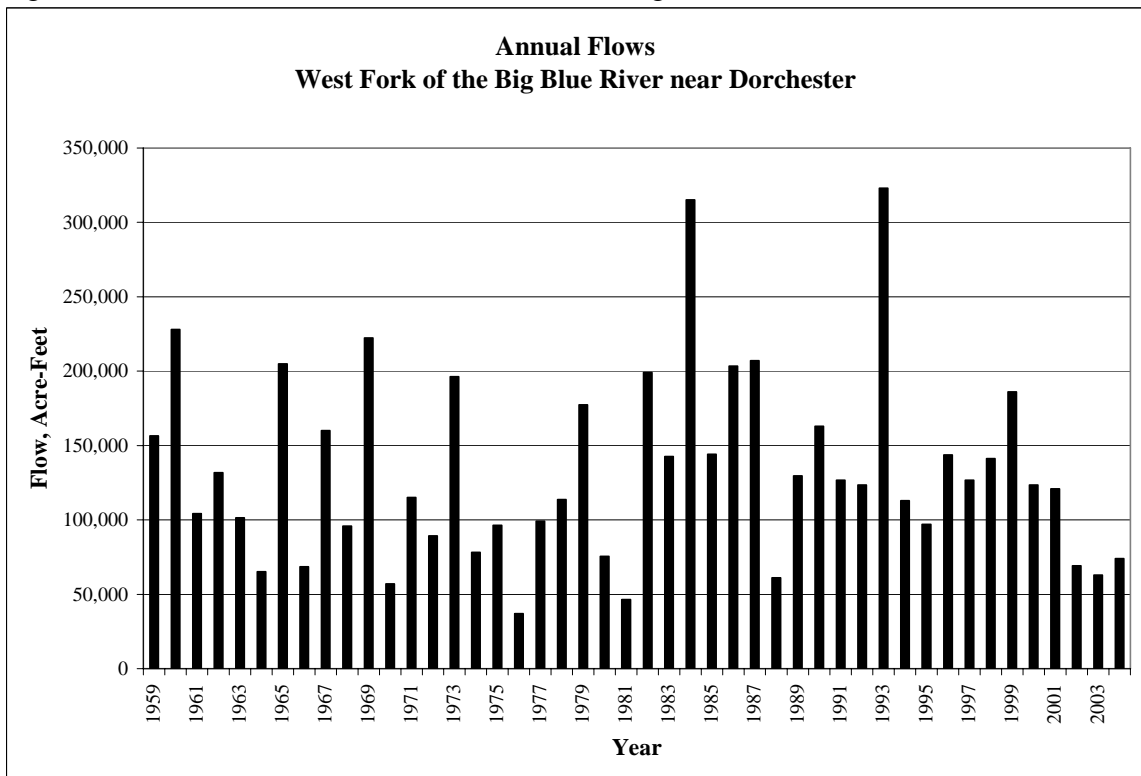


Figure BB-45. Annual Flows, Turkey Creek near Wilbur.

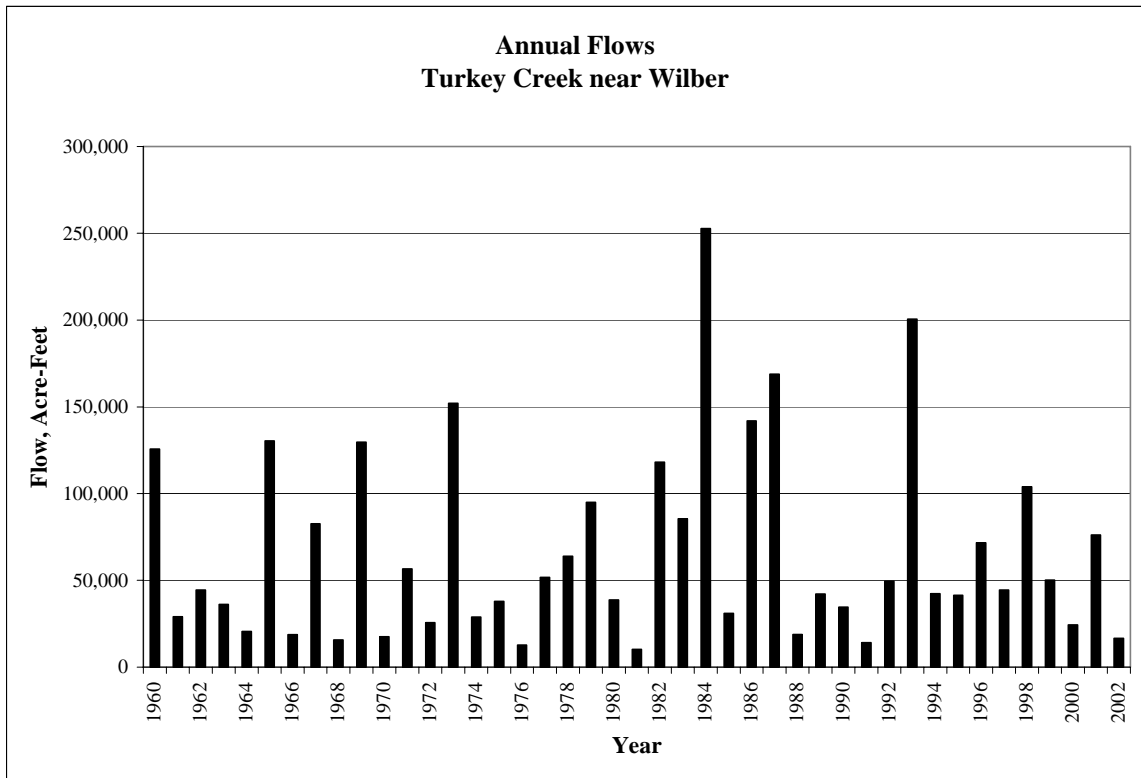


Figure BB-46. Annual Flows, Big Blue River at Surprise.

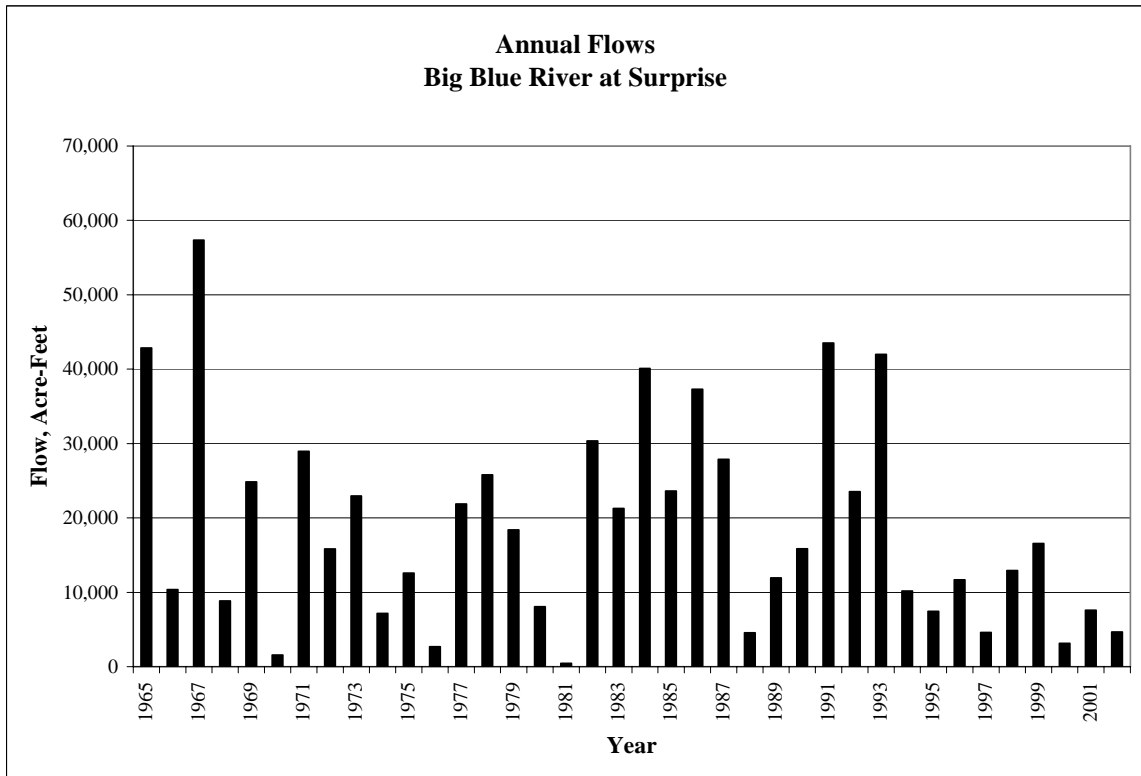


Figure BB-47. Annual Flows, Big Blue River near Seward.

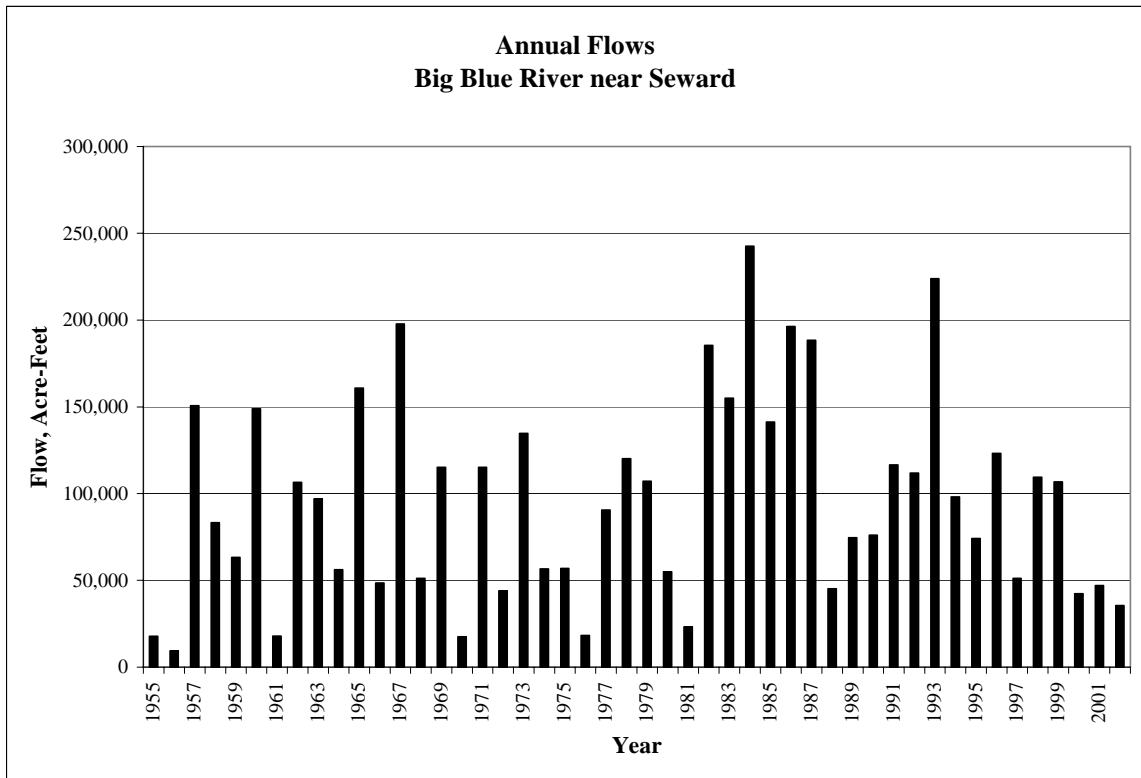


Figure BB-48. Annual Flows, Big Blue River near Crete.

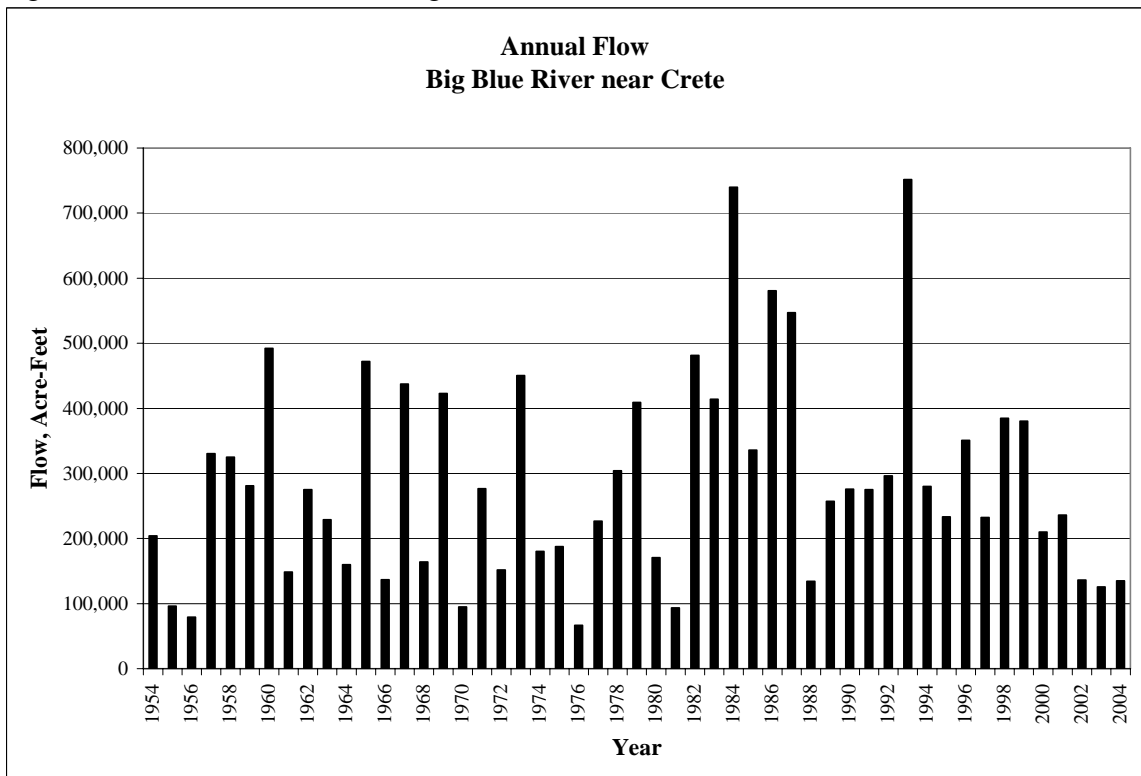


Figure BB-49. Annual Flows, Big Blue River at Beatrice.

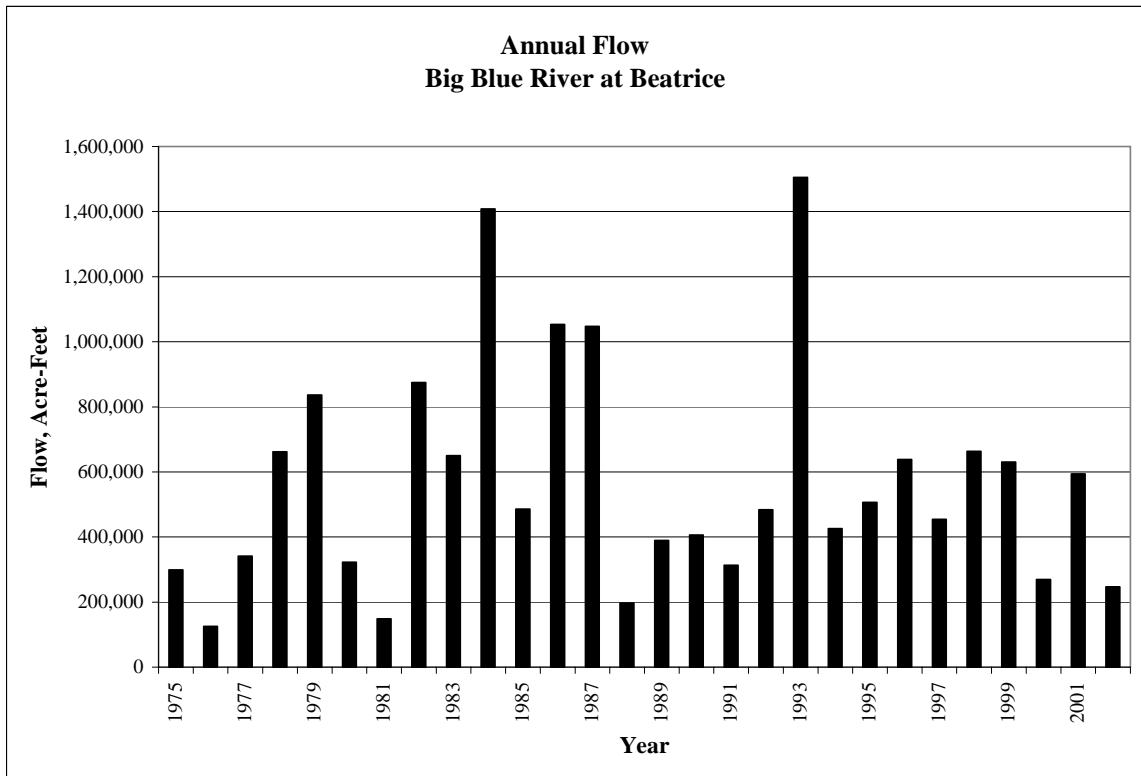
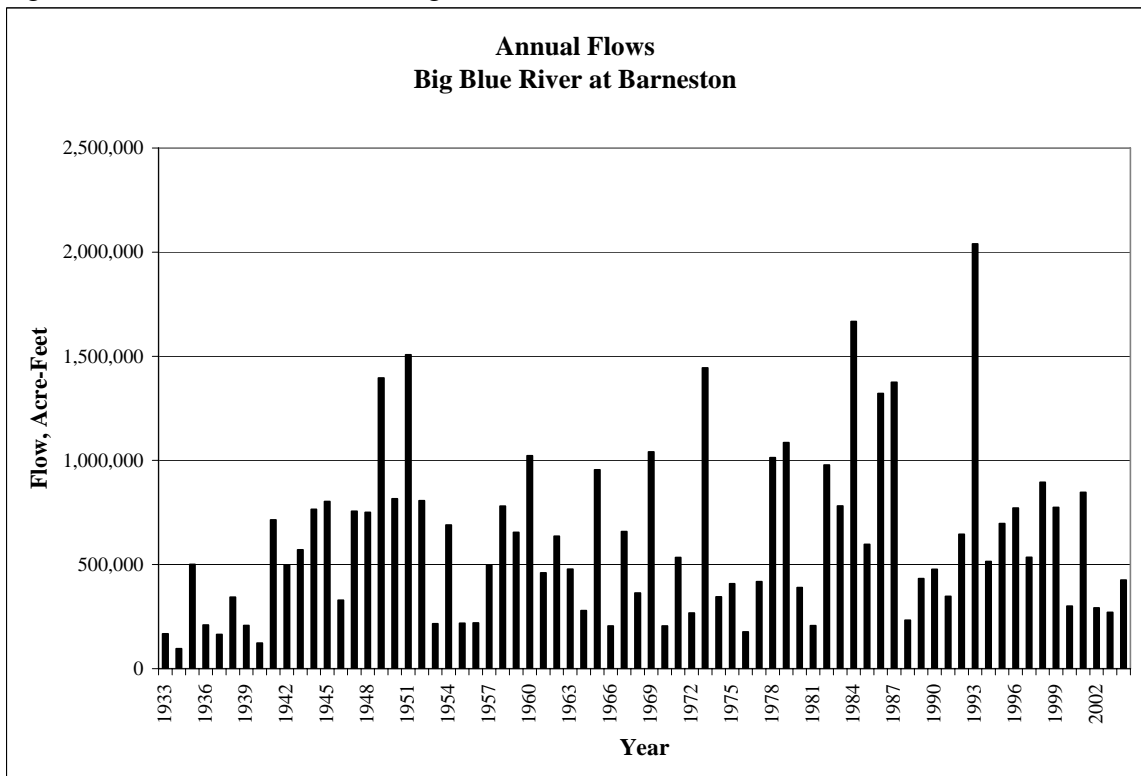


Figure BB-50. Annual Flows, Big Blue River at Barneston.



Cumulative Number of Surface Water Appropriations in Big Blue River Basin by Use

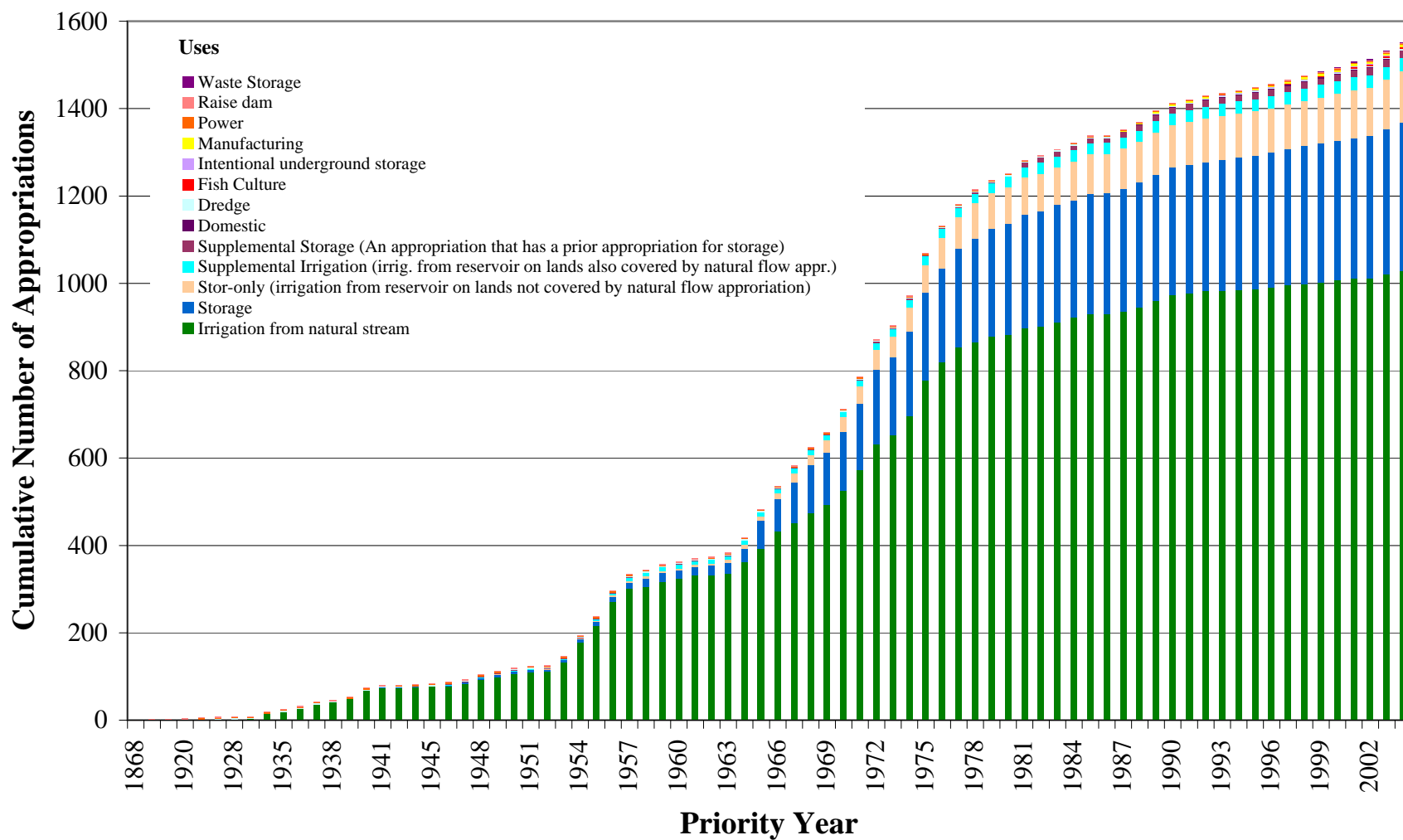


Figure BB-51

Cumulative Surface Water Appropriated Acres in Big Blue River Basin

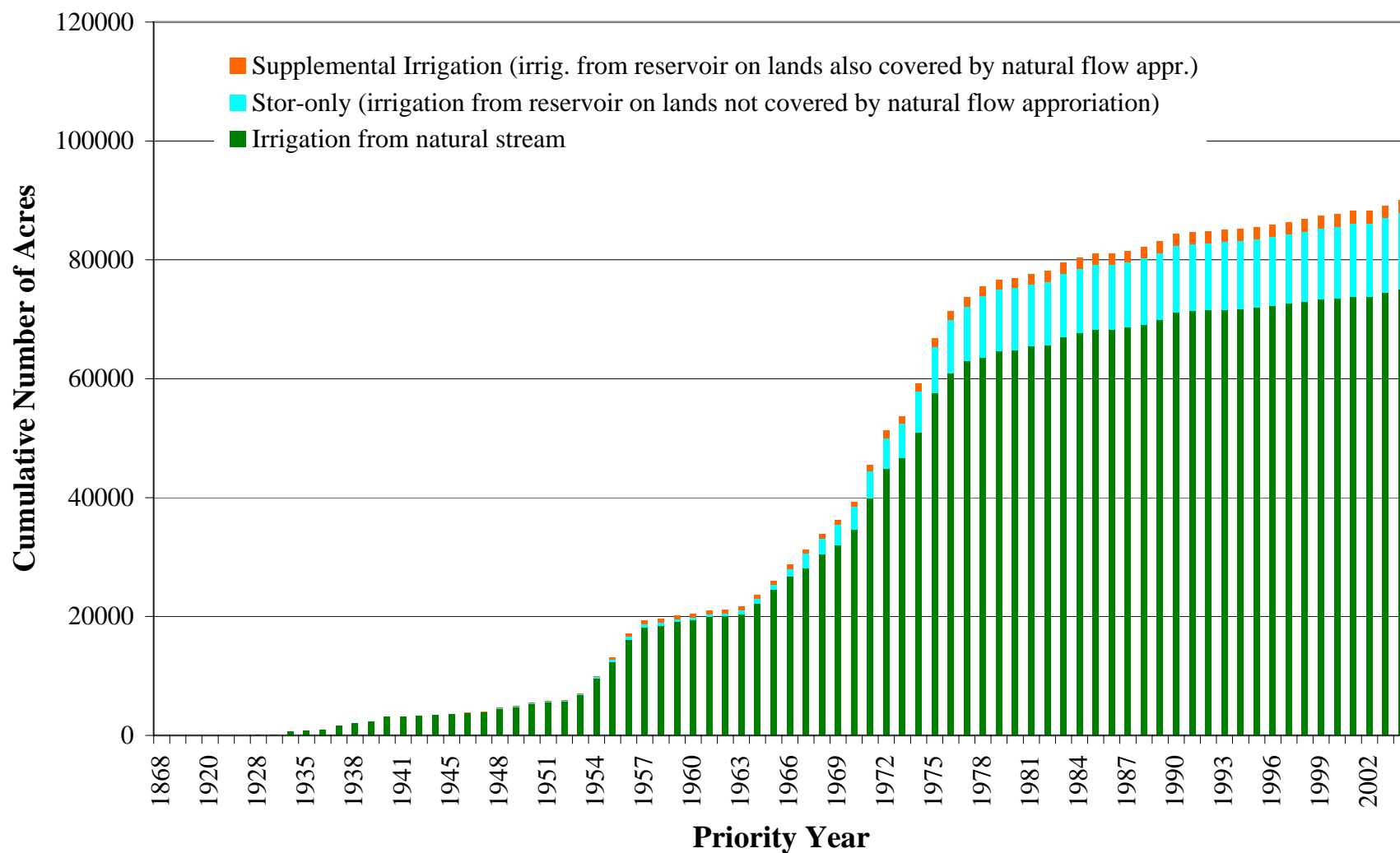
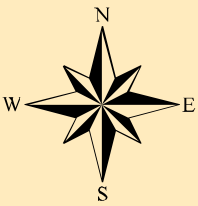


Figure BB-52



Surface Water Irrigation Locations

BIG BLUE RIVER BASIN



Planning and Assistance Division

Explanation

Irrigation Locations

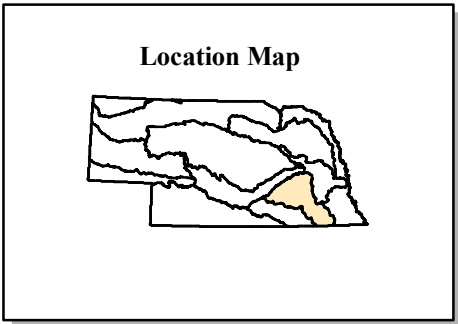
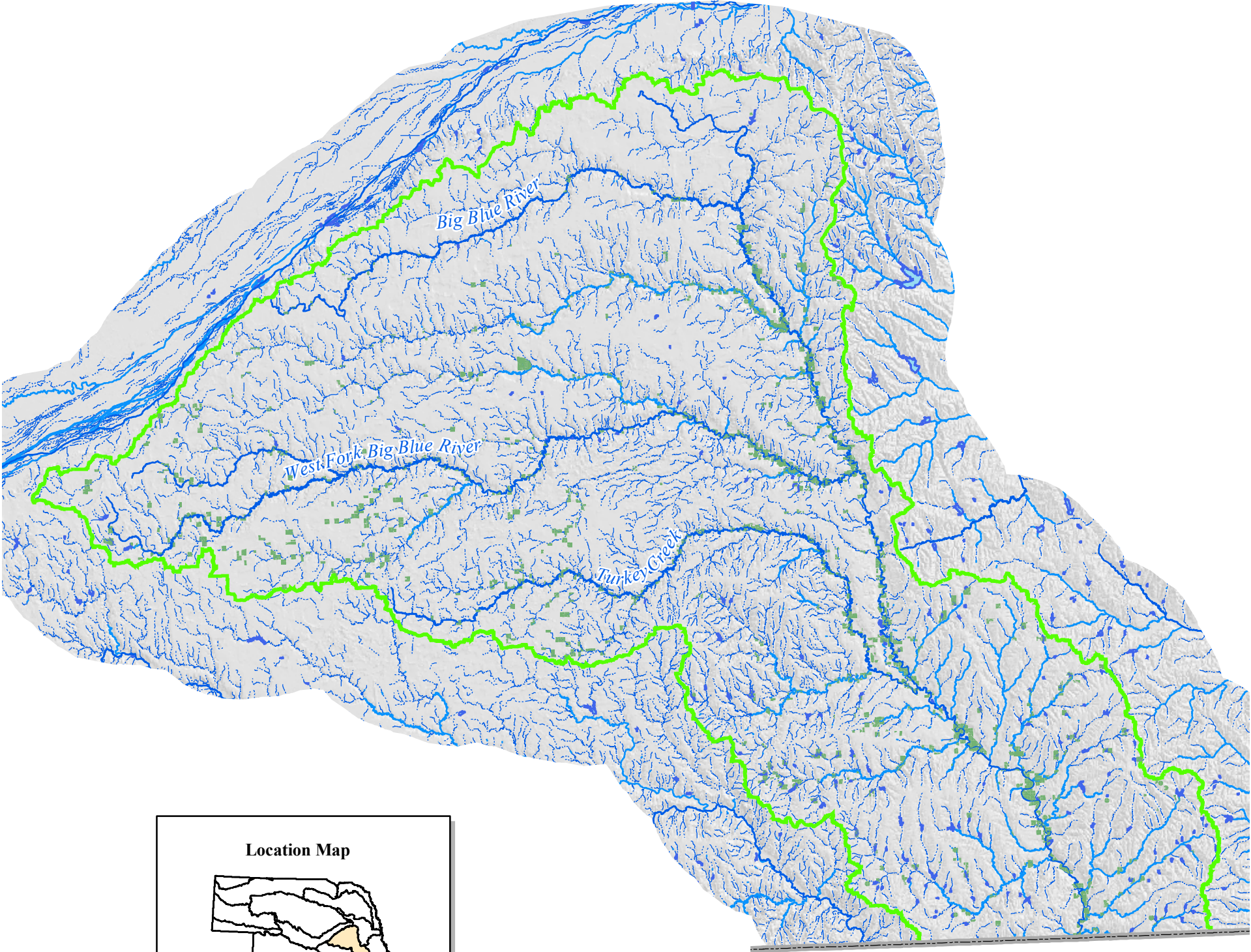
Surface Water Features

Rivers

Intermittent Streams

Lakes

Big Blue Basin



Surface water irrigation location information digitized by DNR staff from surface water irrigation application maps.

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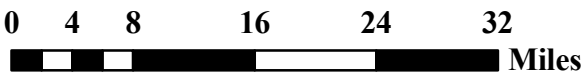
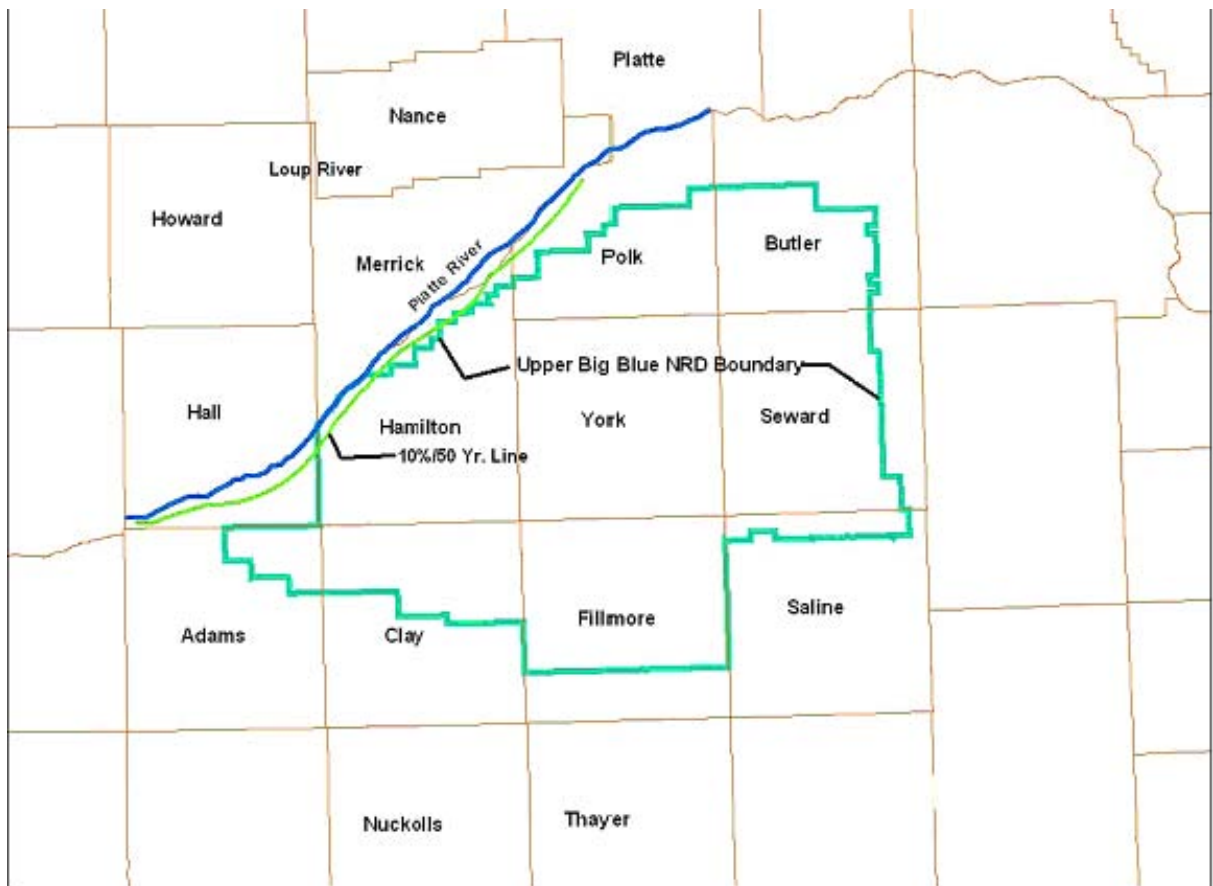


Figure BB-53.

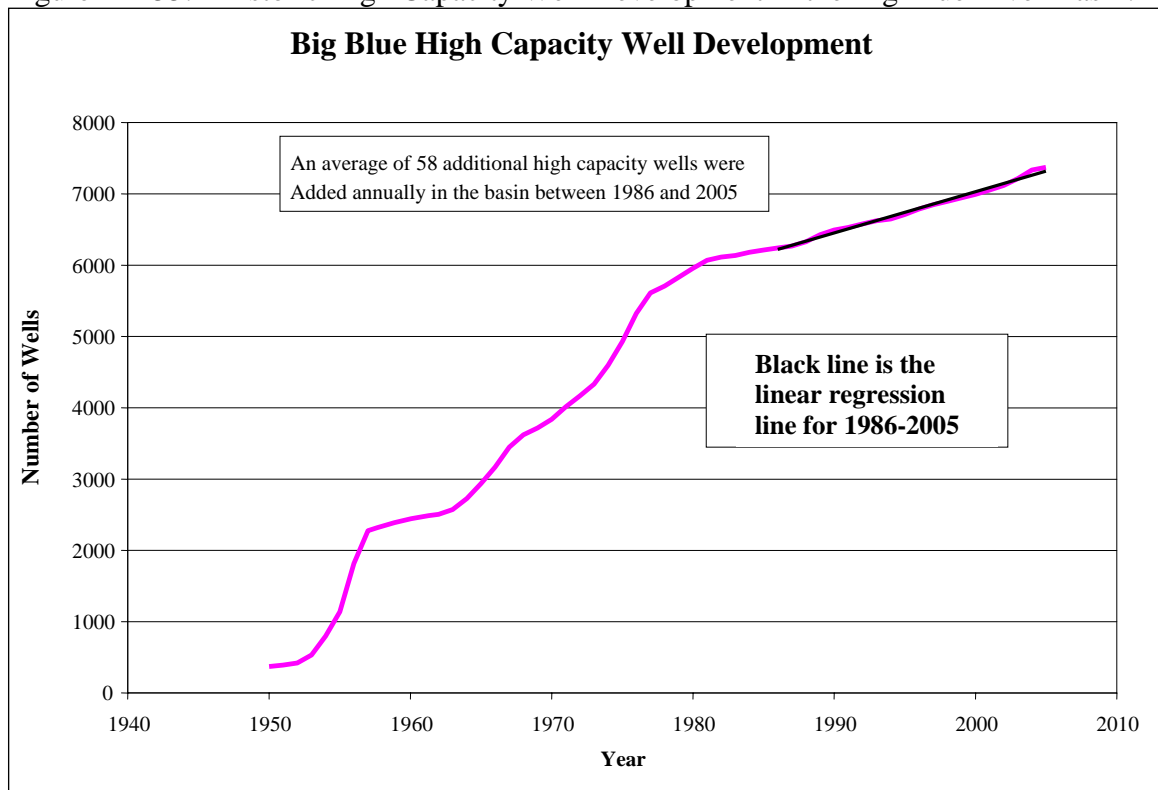
Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Surface water irrigation locations map produced by Jeff Shafer, October 6, 2005

Figure BB-54. 10/50 Area on the Platte River in the Upper Big Blue NRD



Bitner, J. UBBNRD, 20005

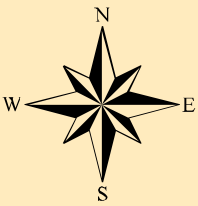
Figure BB-55. Historic High Capacity Well Development in the Big Blue River Basin.



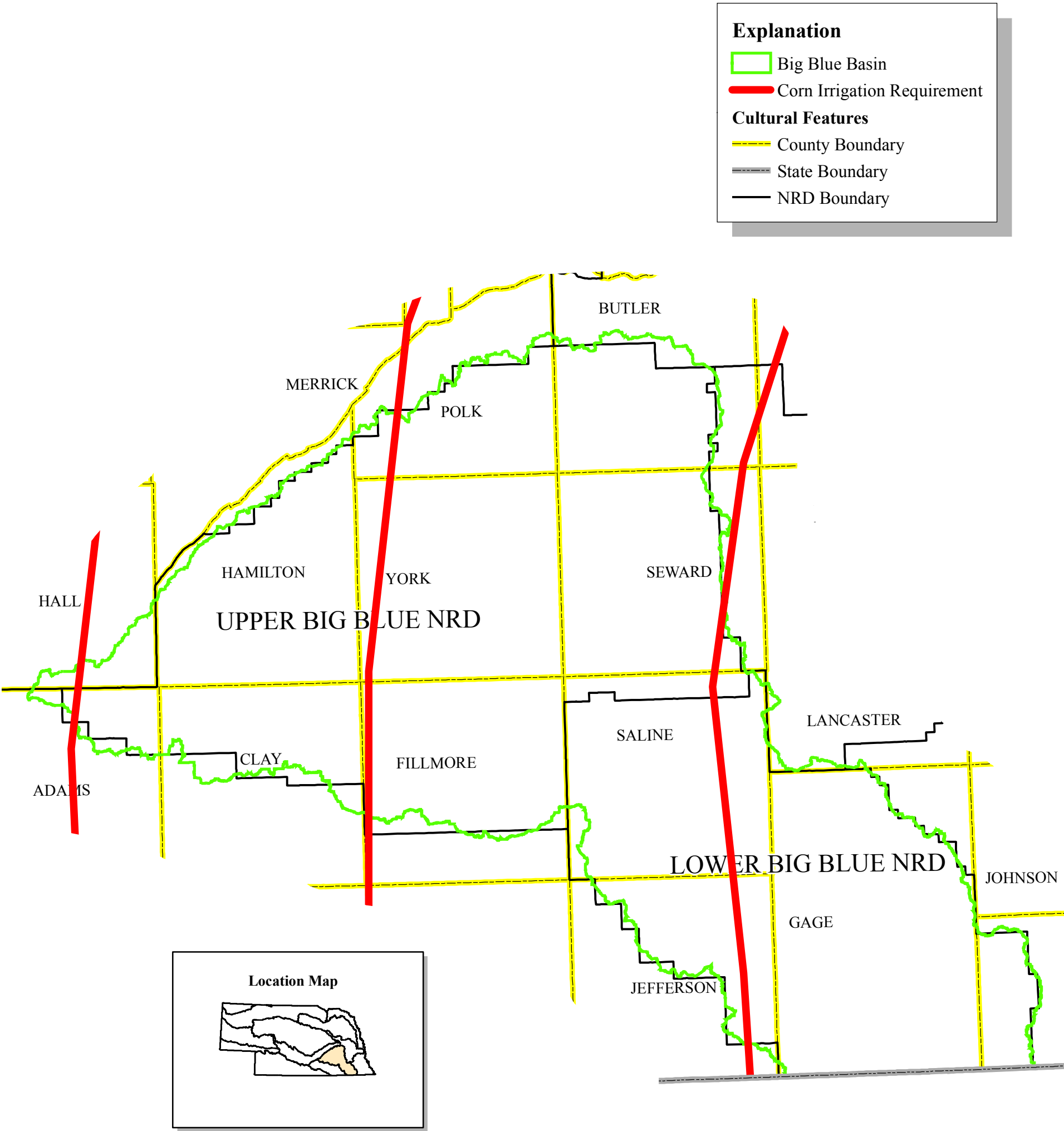


Corn Irrigation Requirement

BIG BLUE RIVER BASIN



Planning and Assistance Division



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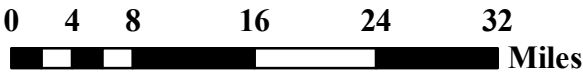


Figure BB-56.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Transmissivity map produced by Kevin J. Schwartzman, December 7, 2005

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